



(12) **United States Patent**
Lee

(10) **Patent No.:** **US 11,489,957 B2**
(45) **Date of Patent:** **Nov. 1, 2022**

(54) **ELECTRONIC DEVICE, EXTERNAL ELECTRONIC DEVICE, AND METHOD FOR CONTROLLING EXTERNAL ELECTRONIC DEVICE BY USING ELECTRONIC DEVICE**

(58) **Field of Classification Search**
CPC .. G06F 3/0488; G06F 3/04883; G06F 3/0484; G08C 2201/30; H04M 1/72415; H04M 1/72412; H04M 1/725
See application file for complete search history.

(71) Applicant: **Samsung Electronics Co., Ltd.**,
Gyeonggi-do (KR)

(56) **References Cited**

(72) Inventor: **Seungyup Lee**, Gyeonggi-do (KR)

U.S. PATENT DOCUMENTS

(73) Assignee: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

9,030,611 B2 5/2015 Bae
9,813,759 B2 11/2017 Klein et al.
(Continued)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **17/280,273**

KR 10-0986619 B1 10/2010
KR 10-2013-0129220 A 11/2013
(Continued)

(22) PCT Filed: **Jul. 25, 2019**

Primary Examiner — Gerald Johnson
(74) *Attorney, Agent, or Firm* — Cha & Reiter, LLC

(86) PCT No.: **PCT/KR2019/009267**

§ 371 (c)(1),
(2) Date: **Mar. 26, 2021**

(87) PCT Pub. No.: **WO2020/075960**

PCT Pub. Date: **Apr. 16, 2020**

(65) **Prior Publication Data**

US 2022/0006894 A1 Jan. 6, 2022

(30) **Foreign Application Priority Data**

Oct. 10, 2018 (KR) 10-2018-0120623

(51) **Int. Cl.**

H04M 1/72415 (2021.01)
H04M 1/72469 (2021.01)

(Continued)

(52) **U.S. Cl.**

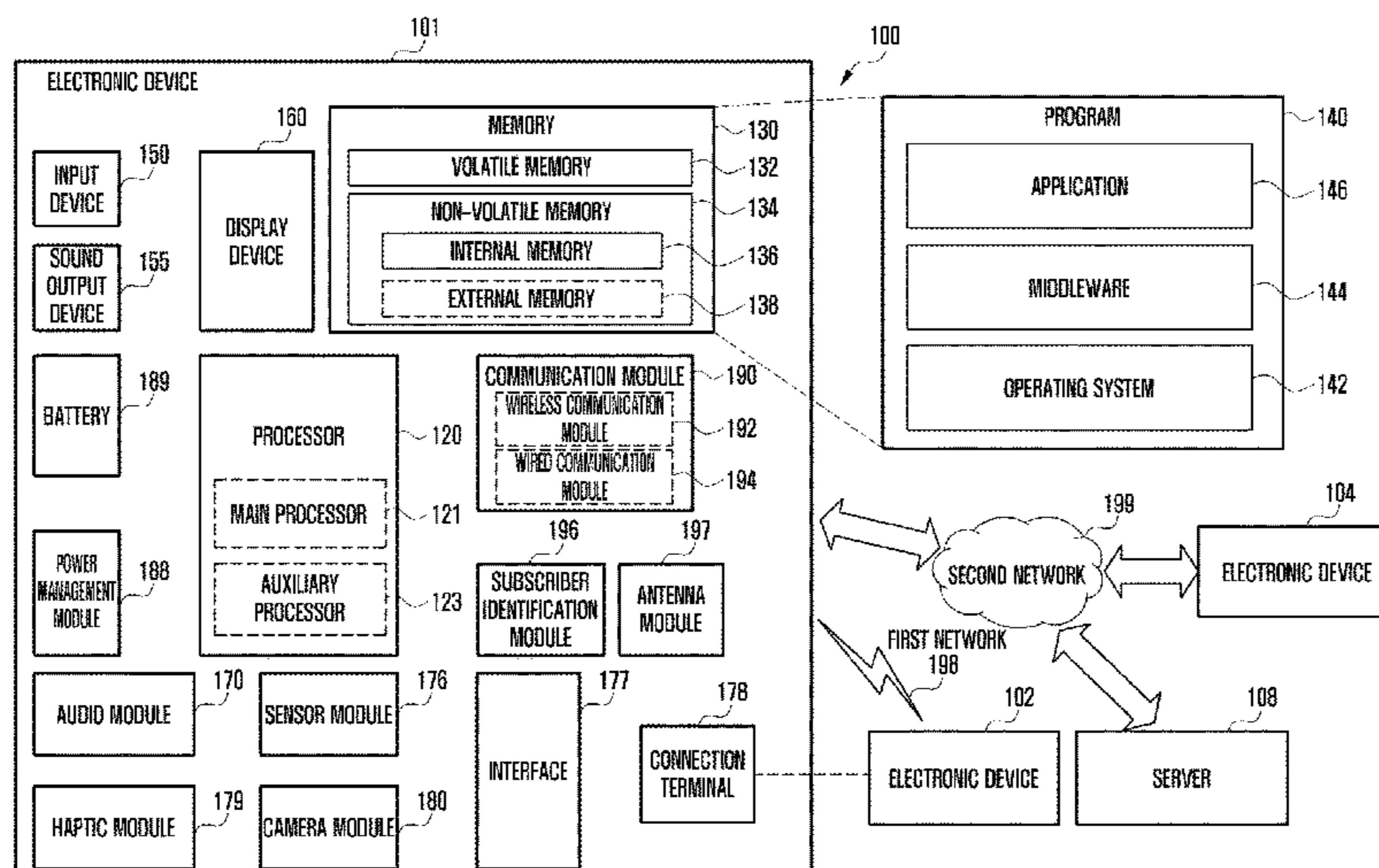
CPC **H04M 1/72415** (2021.01); **G06F 3/0346** (2013.01); **G06F 3/0484** (2013.01);

(Continued)

(57) **ABSTRACT**

In an electronic device and a method for operation of the electronic device according to various embodiments, the electronic device may comprise: a communication module for transmitting/receiving data to or from an external electronic device; a display; a memory in which to store commands to execute on the external electronic device a function mapped onto a user input and state information of the external electronic device; and a processor, wherein the processor is configured to: control the communication module to establish a connection to the external electronic device; receive first state information of the external electronic device from the external electronic device; receive a first user input to a certain area of the display; select a first command corresponding to characteristics of the first user input and the first state information from the commands stored in the memory; and control the external electronic device such that a function corresponding to the first command is executed. Various other embodiments are also possible.

11 Claims, 44 Drawing Sheets



- (51) **Int. Cl.**
G06F 3/0346 (2013.01)
G06F 3/0484 (2022.01)
G06F 3/04883 (2022.01)
H04M 1/725 (2021.01)

- (52) **U.S. Cl.**
CPC *G06F 3/04883* (2013.01); *H04M 1/725*
(2013.01); *H04M 1/72469* (2021.01)

(56) **References Cited**

U.S. PATENT DOCUMENTS

2012/0154293 A1 6/2012 Hinckley et al.
2012/0319951 A1 12/2012 Lee
2016/0062467 A1 3/2016 Buxton et al.
2016/0104371 A1* 4/2016 Selfe G08C 17/02
340/4.32
2016/0351047 A1 12/2016 Han et al.
2017/0011210 A1* 1/2017 Cheong A61B 5/681
2018/0188944 A1 7/2018 Cho

FOREIGN PATENT DOCUMENTS

KR 10-2015-0072766 A 6/2015
KR 10-2015-0099324 A 8/2015
KR 10-2016-0069672 A 6/2016
KR 10-2018-0079702 A 7/2018

* cited by examiner

FIG. 1

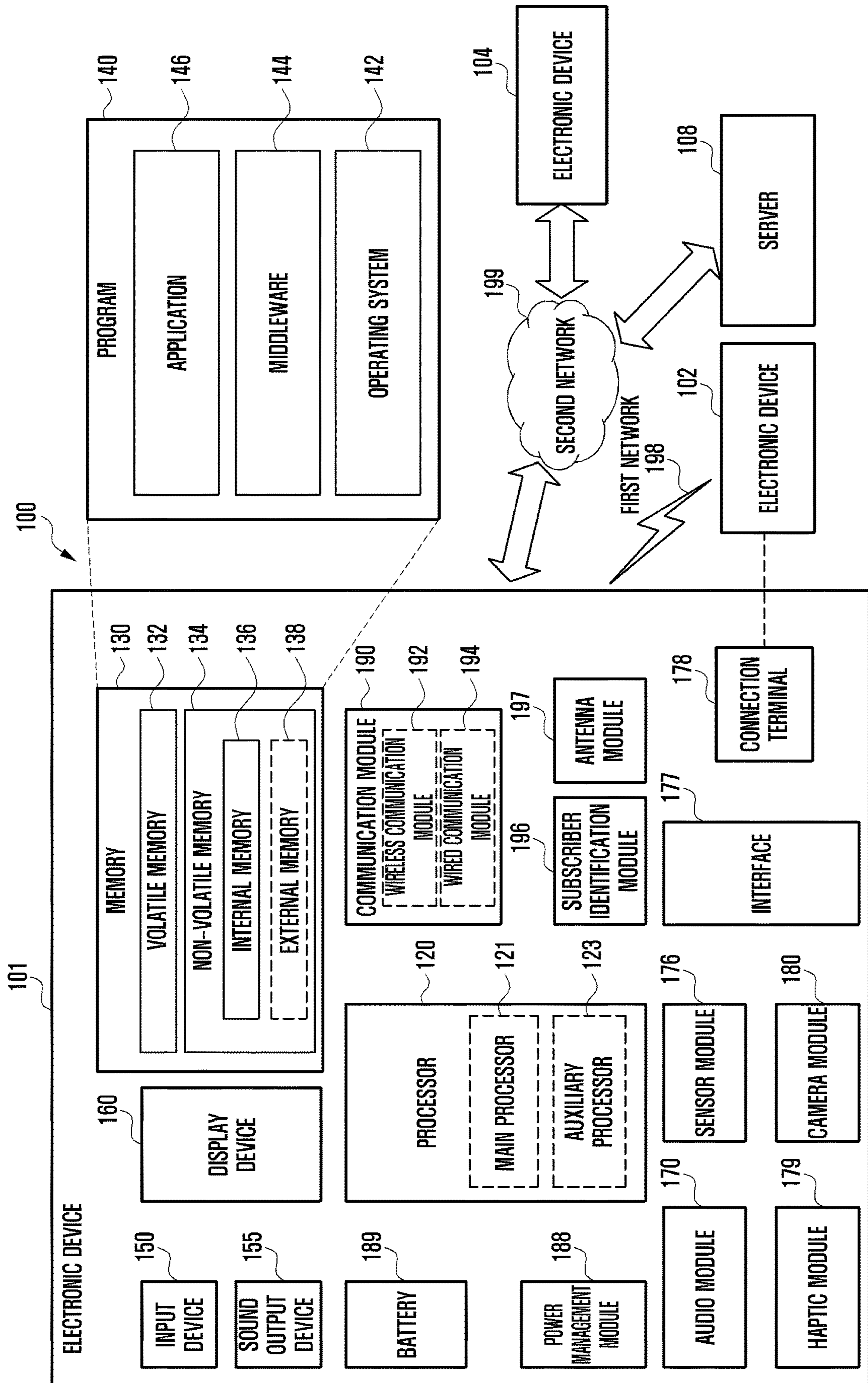


FIG. 2

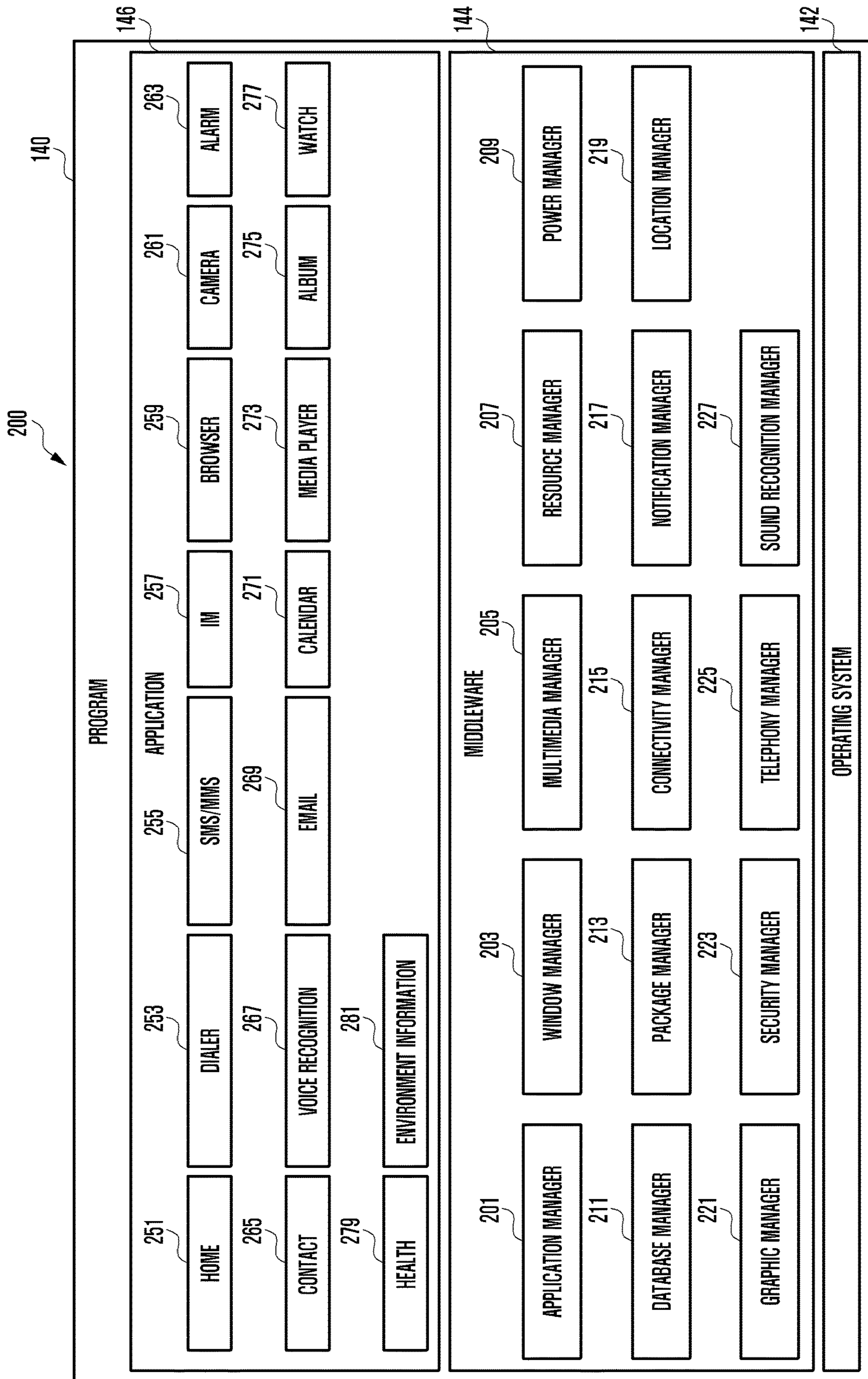


FIG. 3

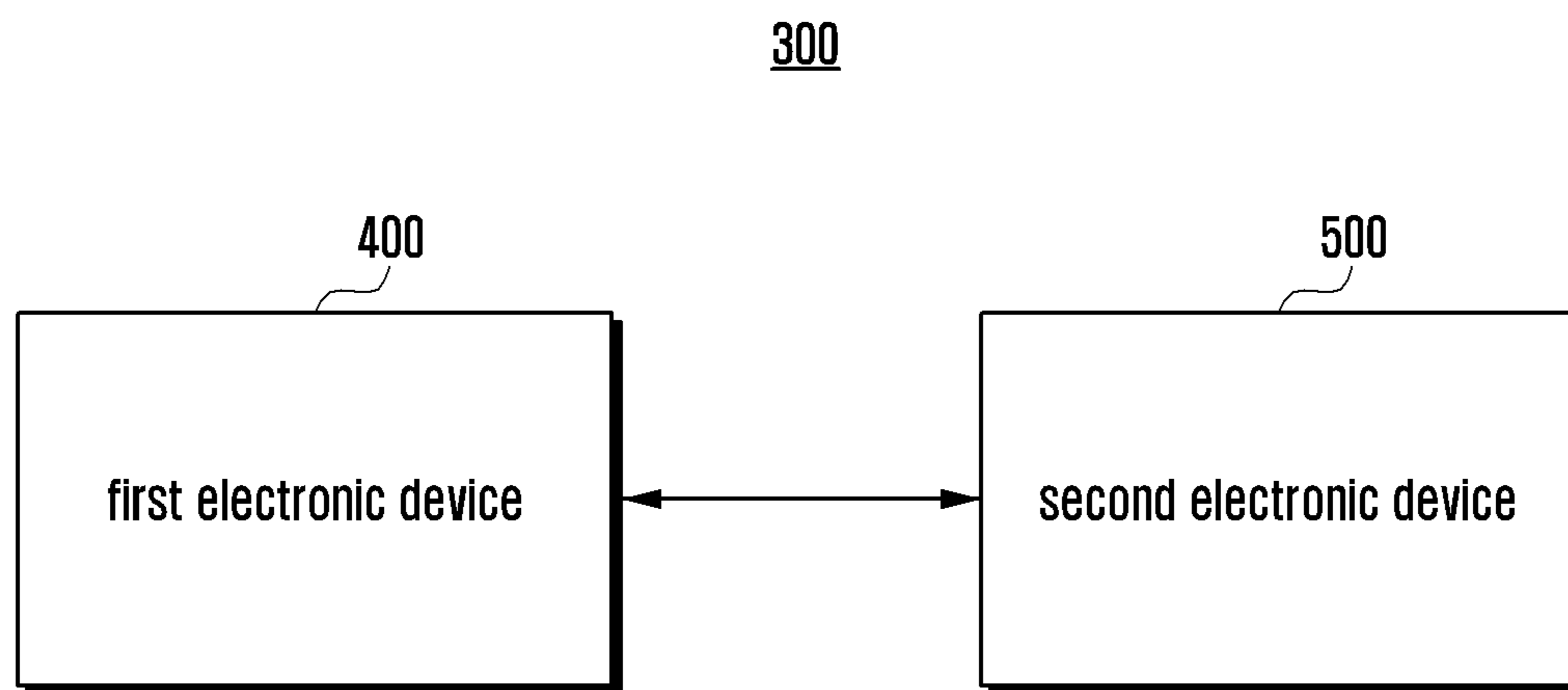


FIG. 4

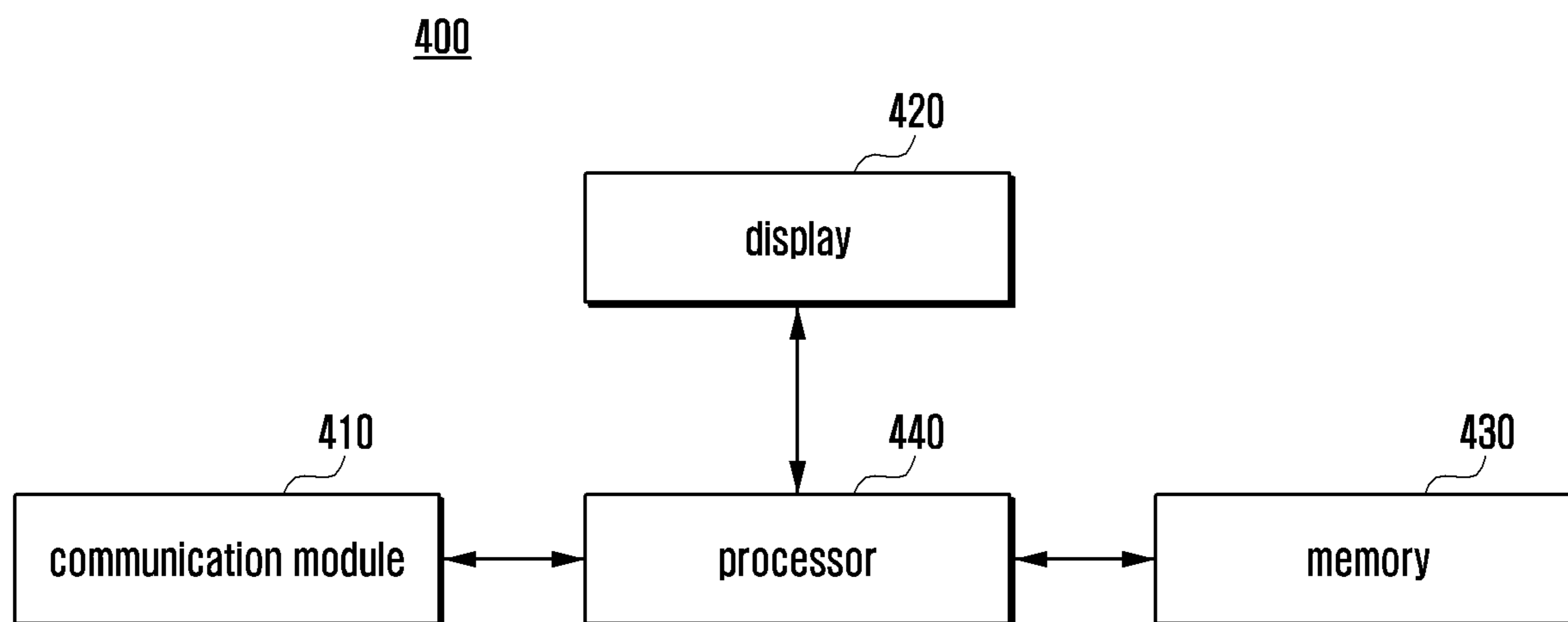


FIG. 5

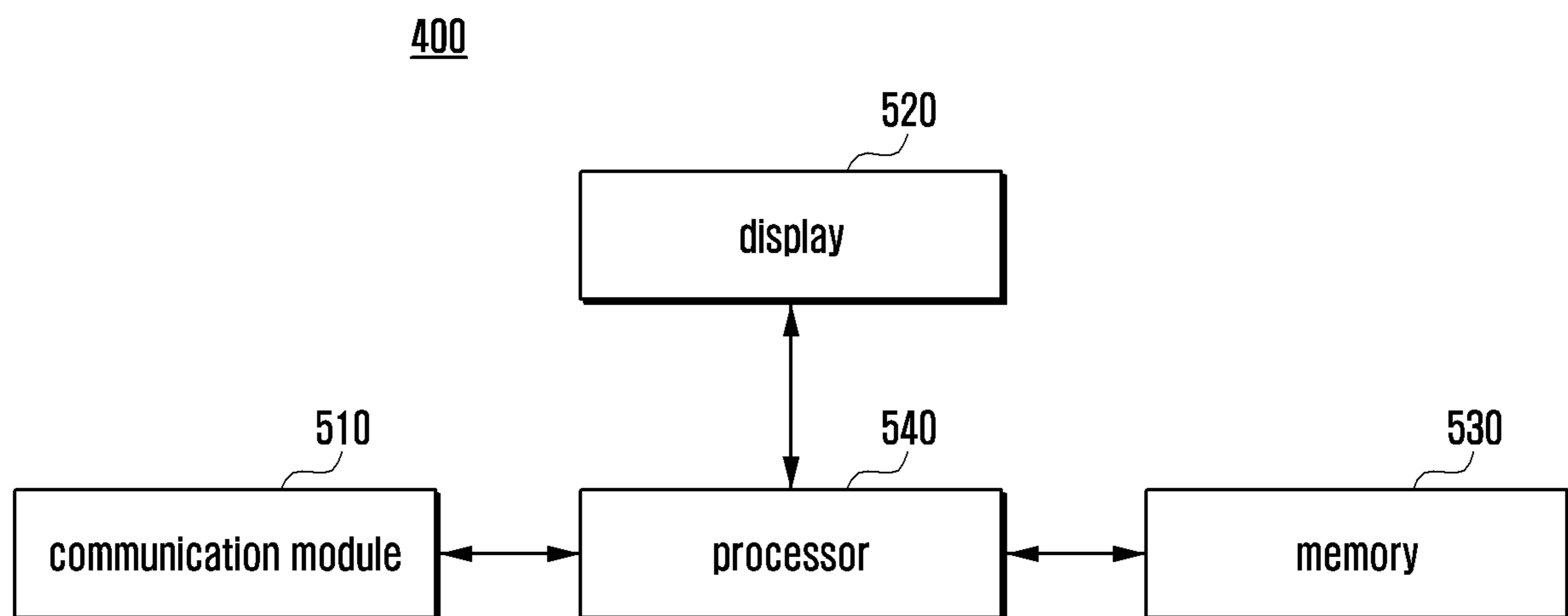


FIG. 6

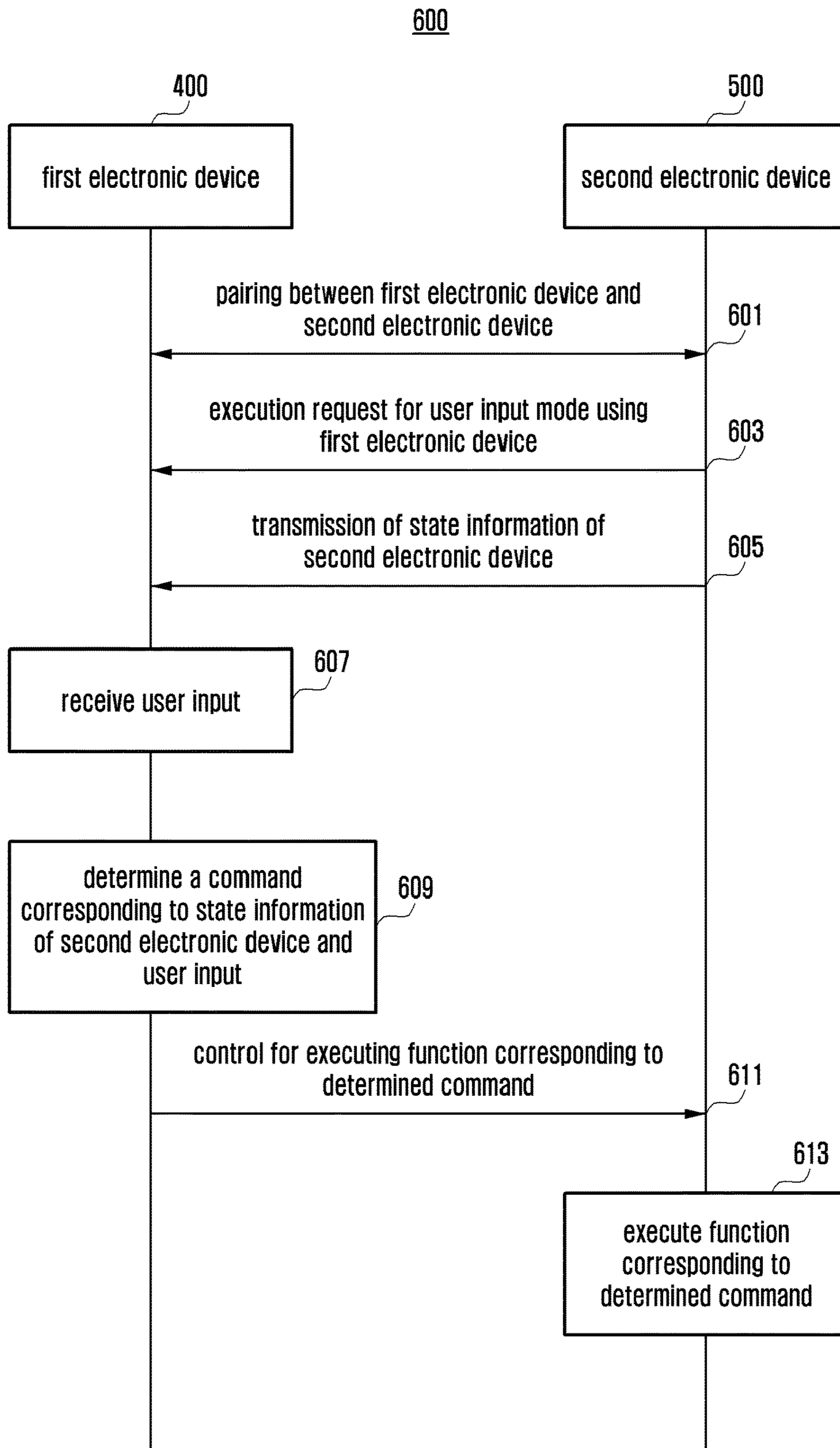


FIG. 7A

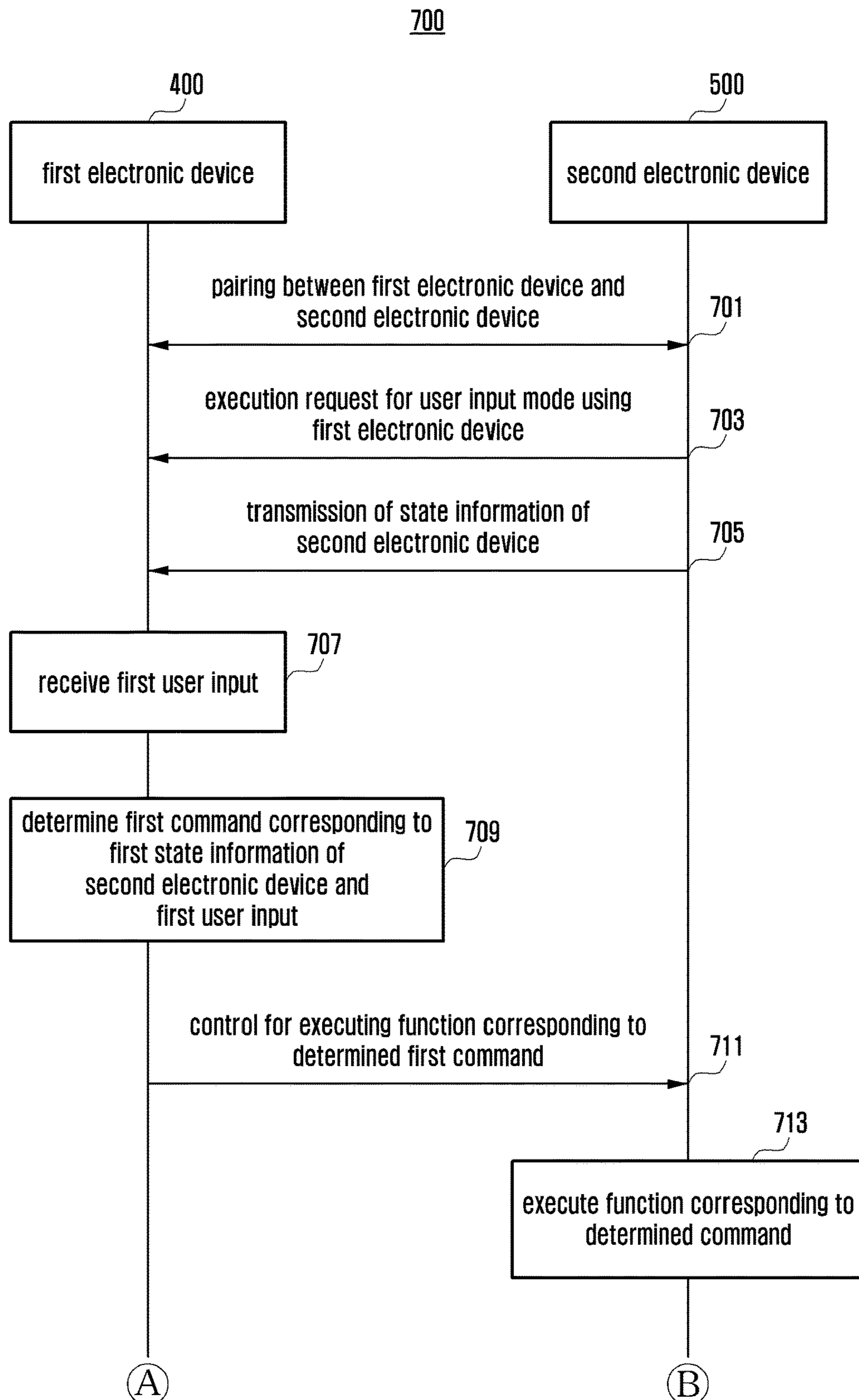


FIG. 7B

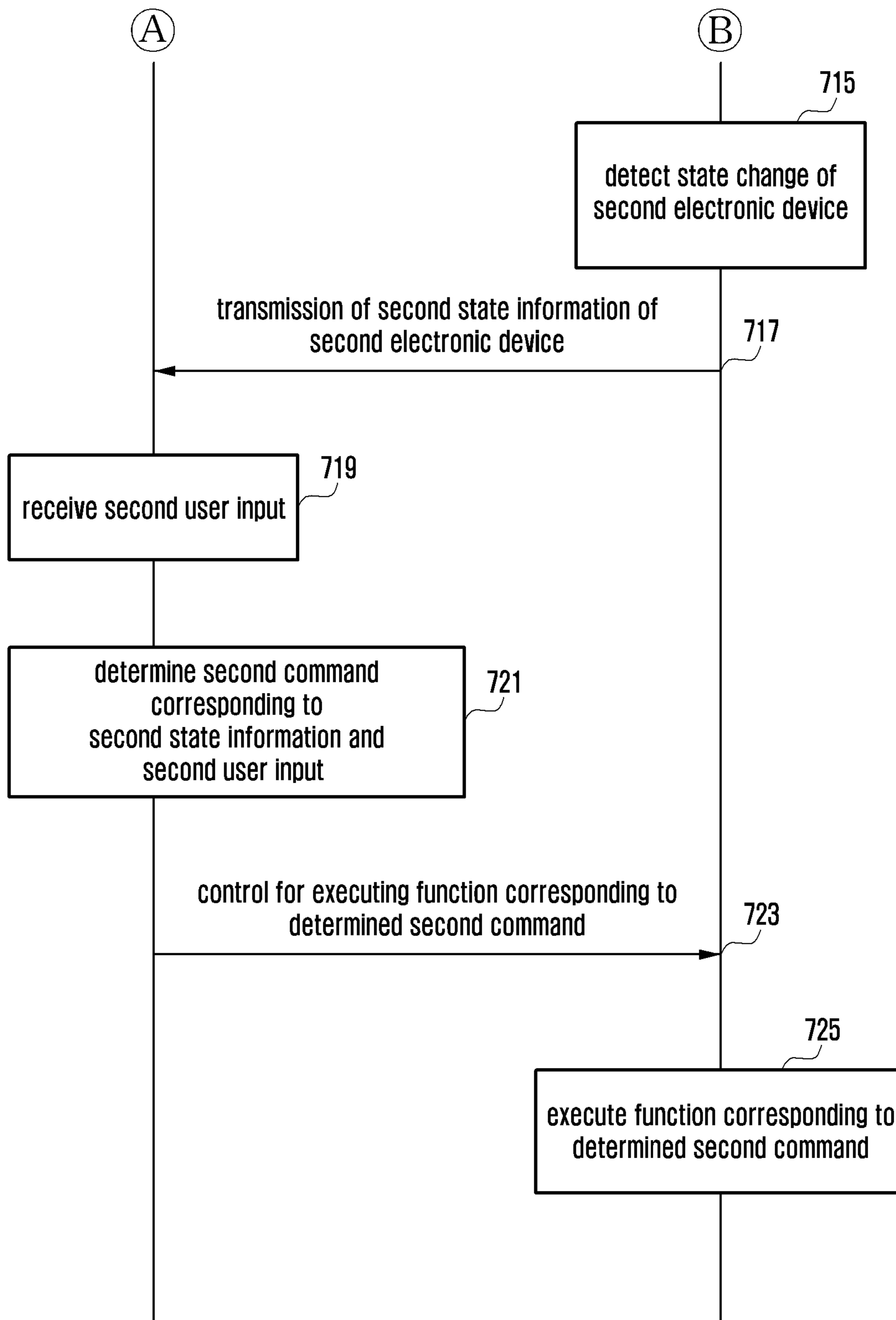


FIG. 8

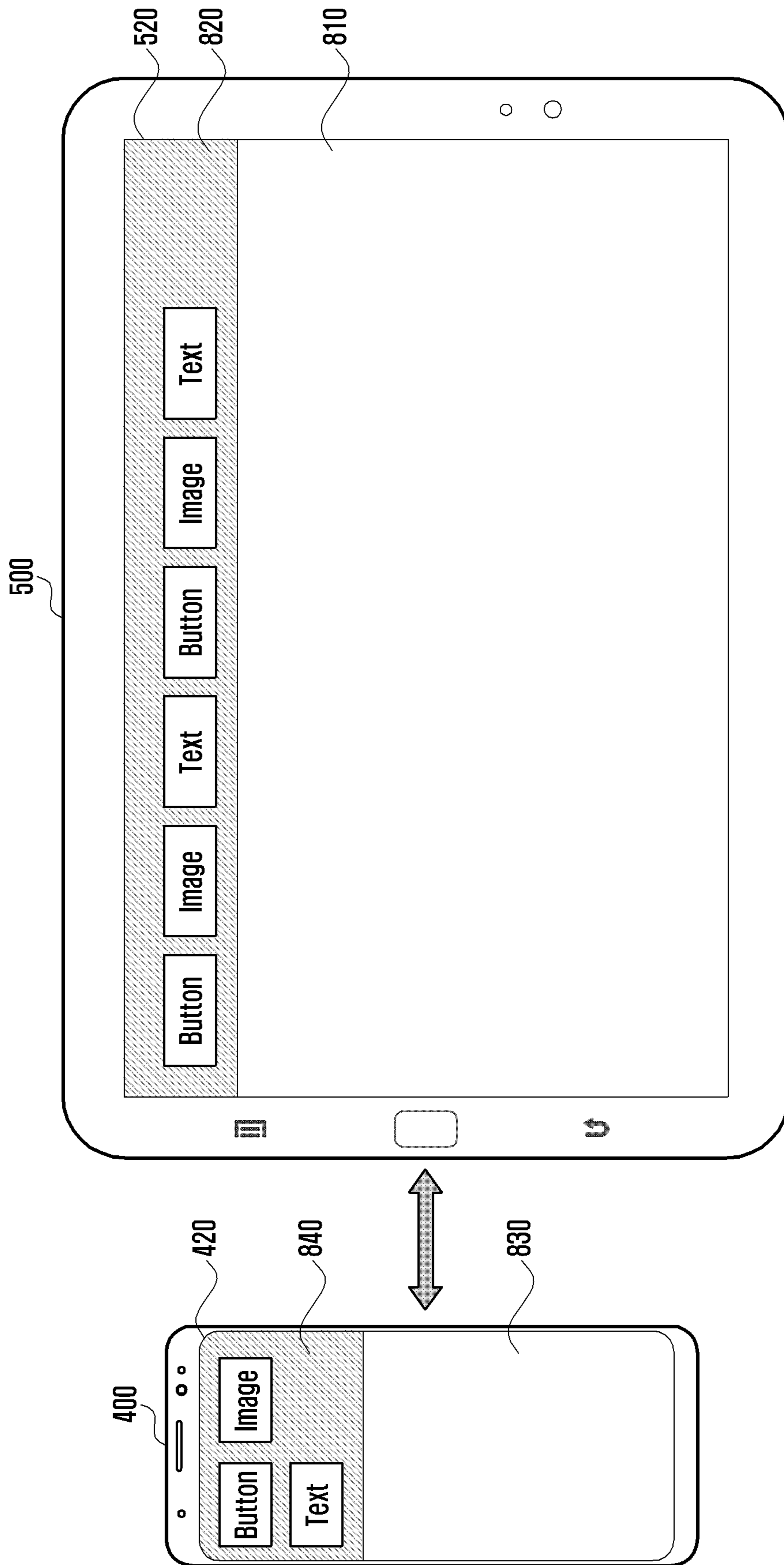


FIG. 9A

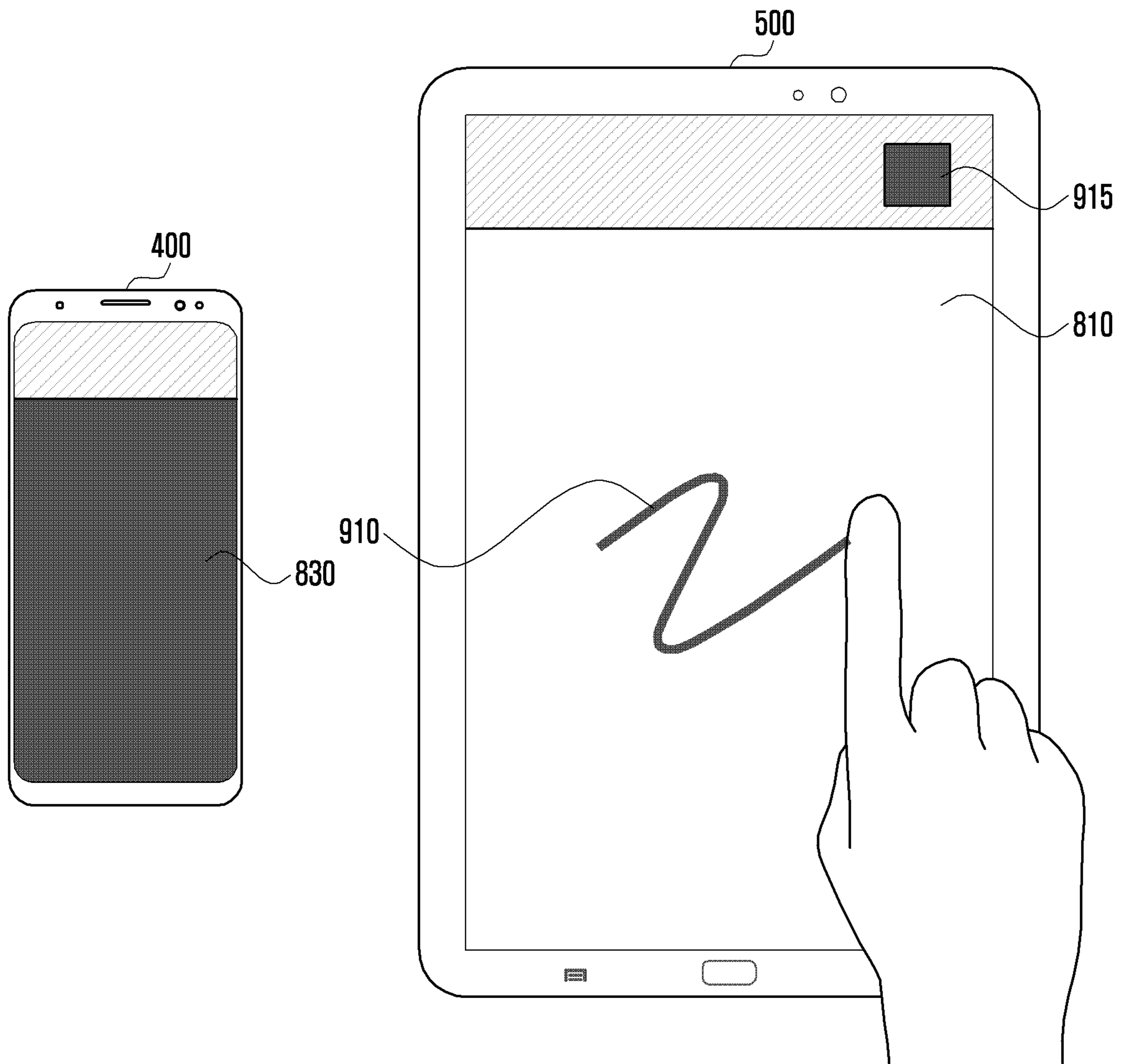


FIG. 9B

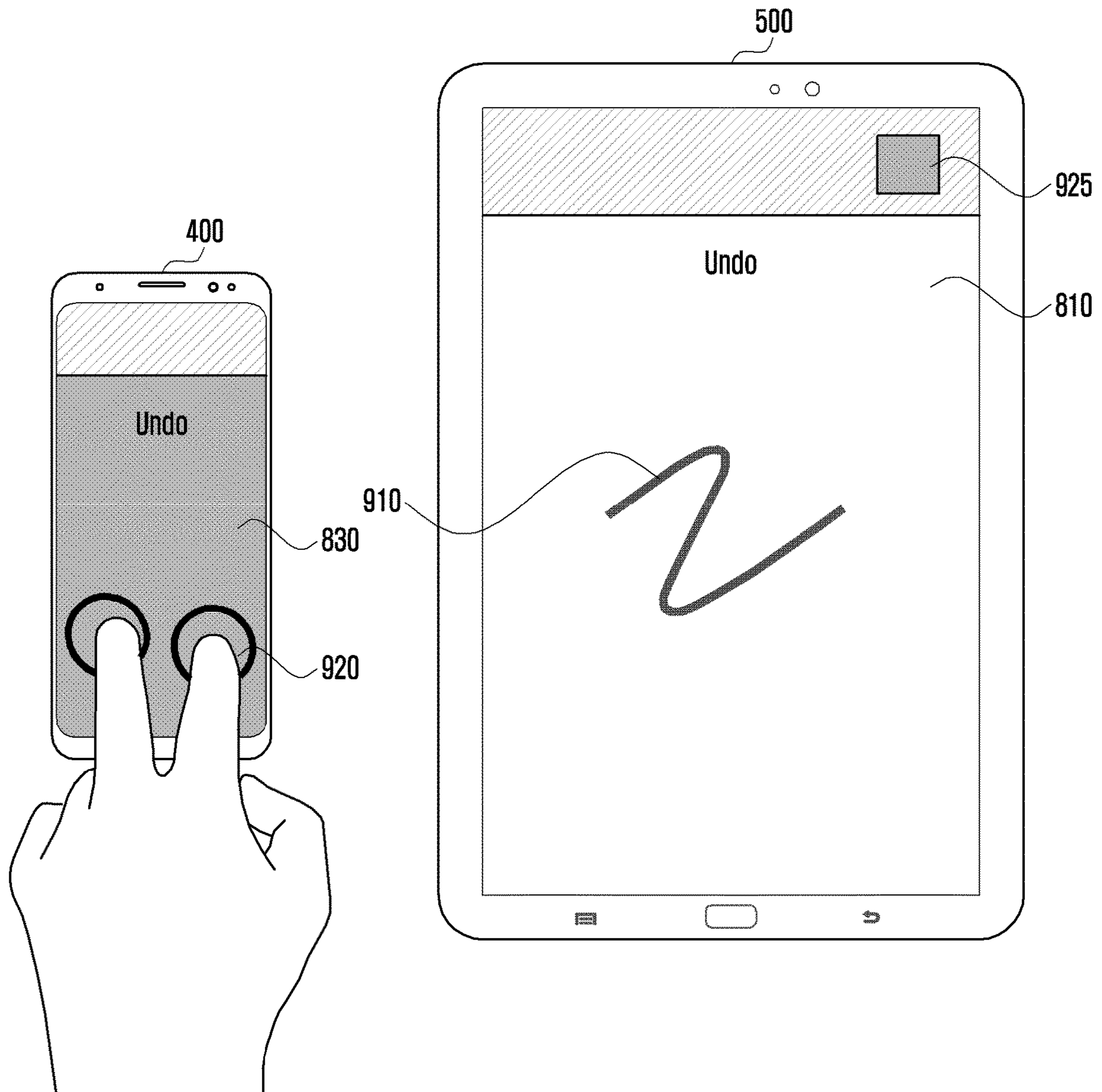


FIG. 9C

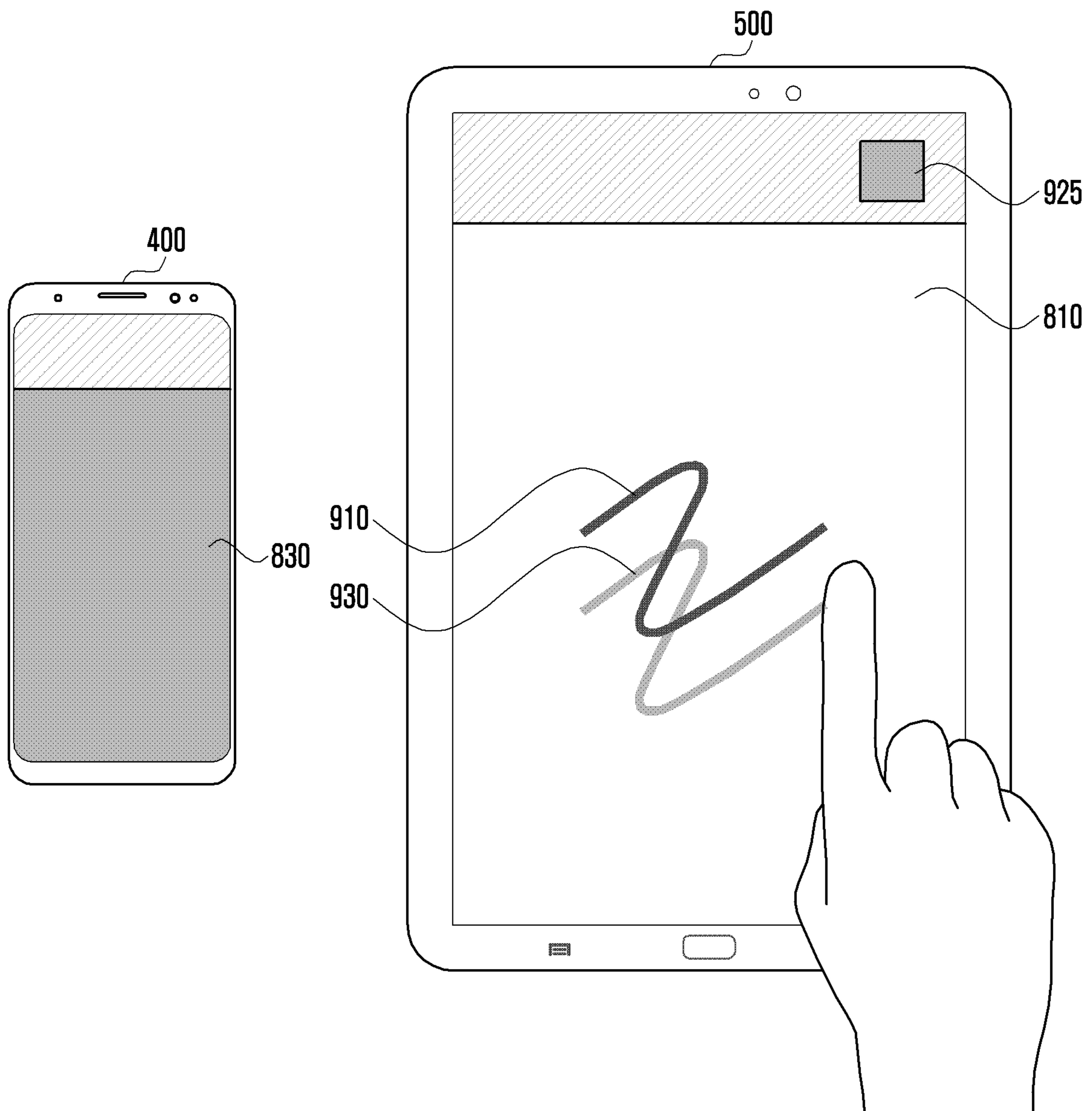


FIG. 10A

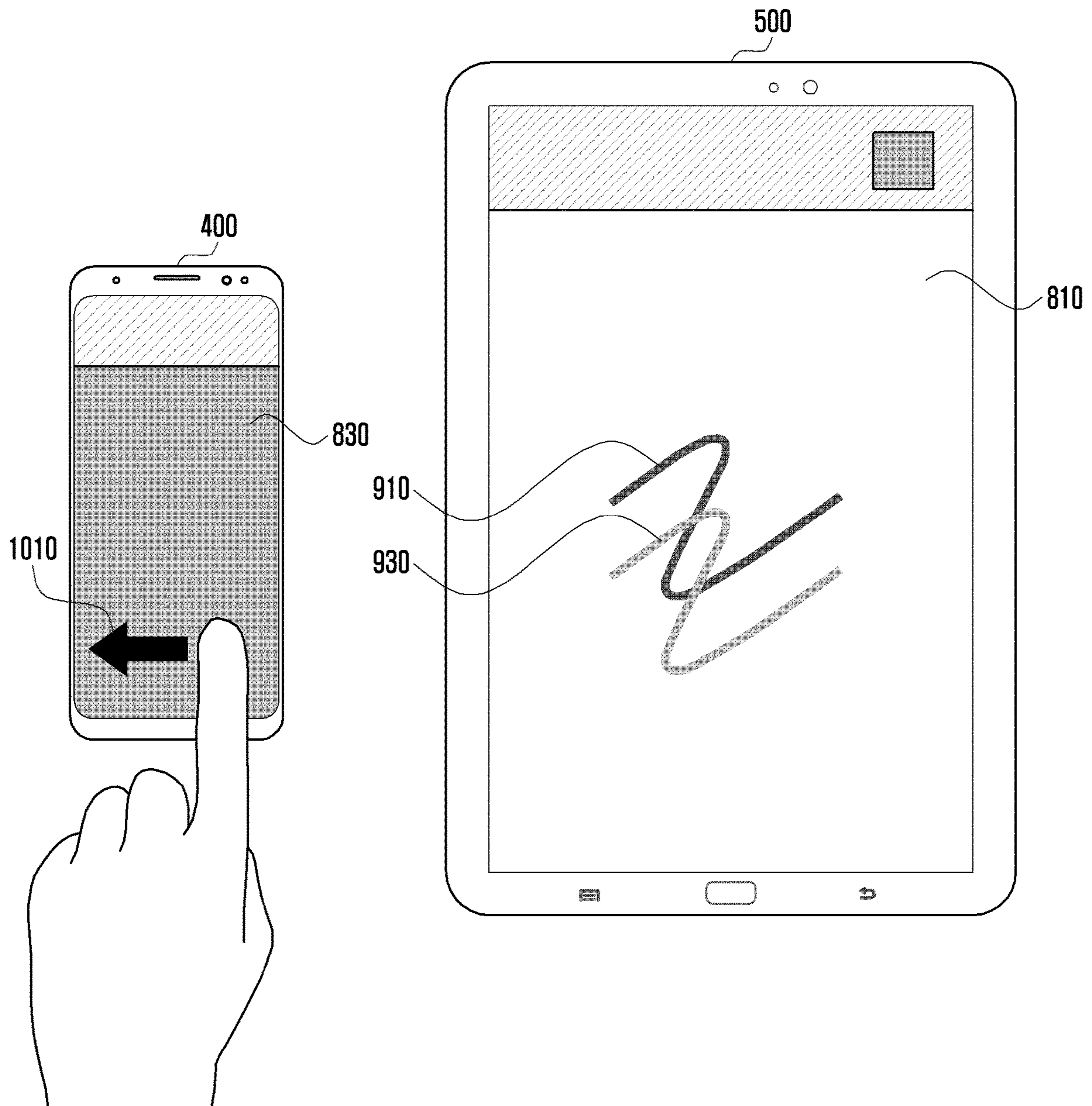


FIG. 10B

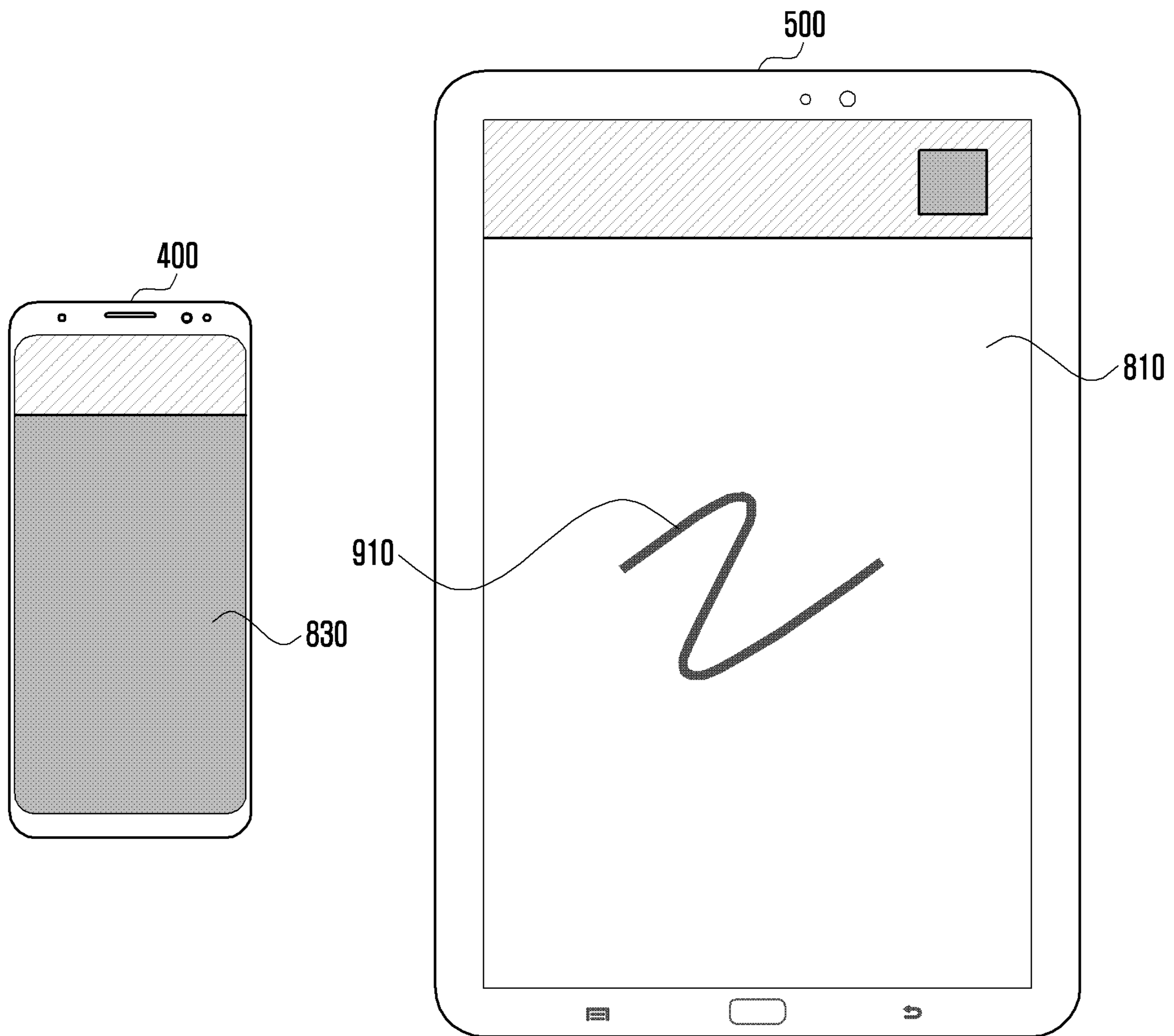


FIG. 11A

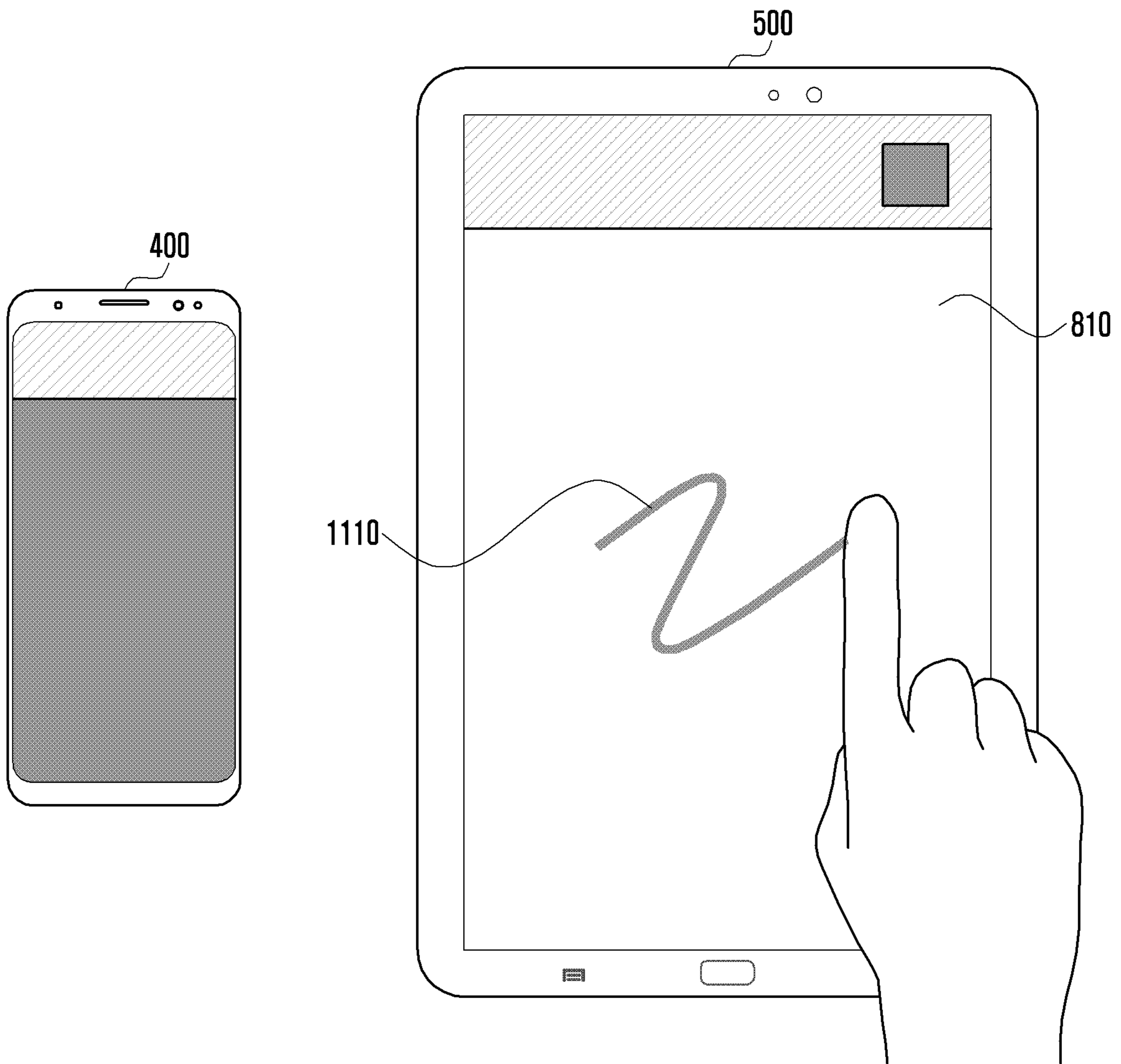


FIG. 11B

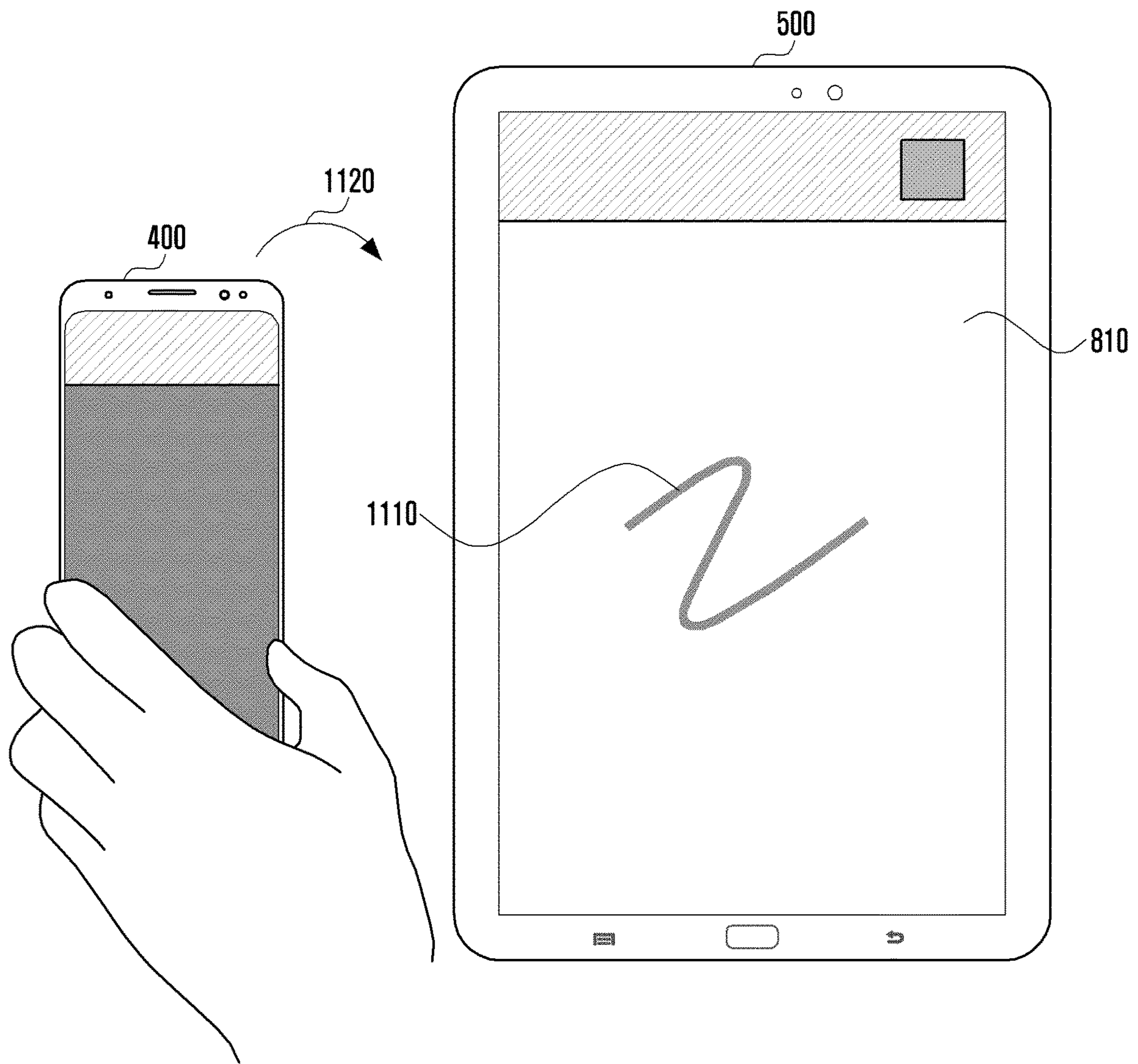


FIG. 11C

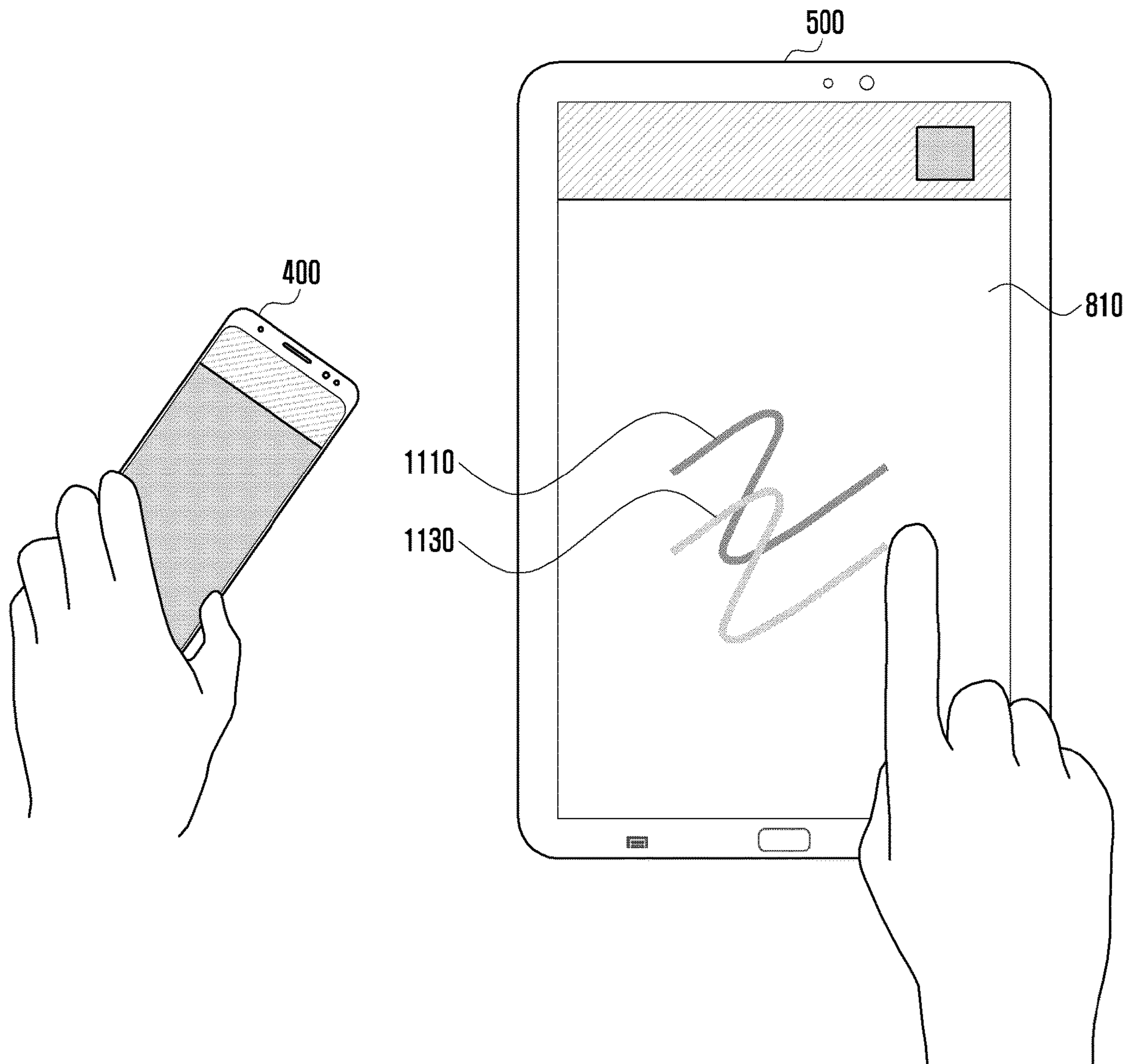


FIG. 12A

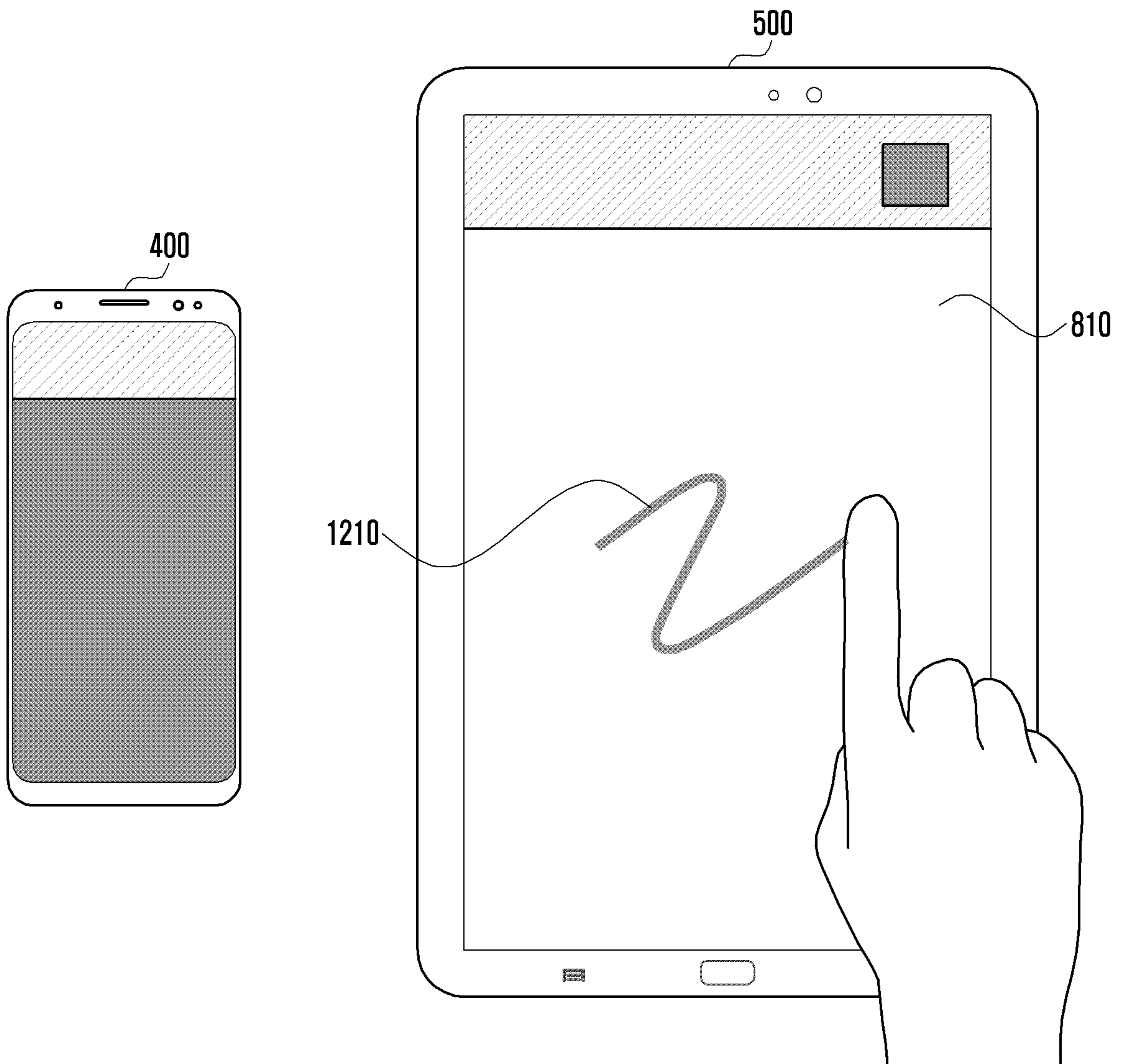


FIG. 12B

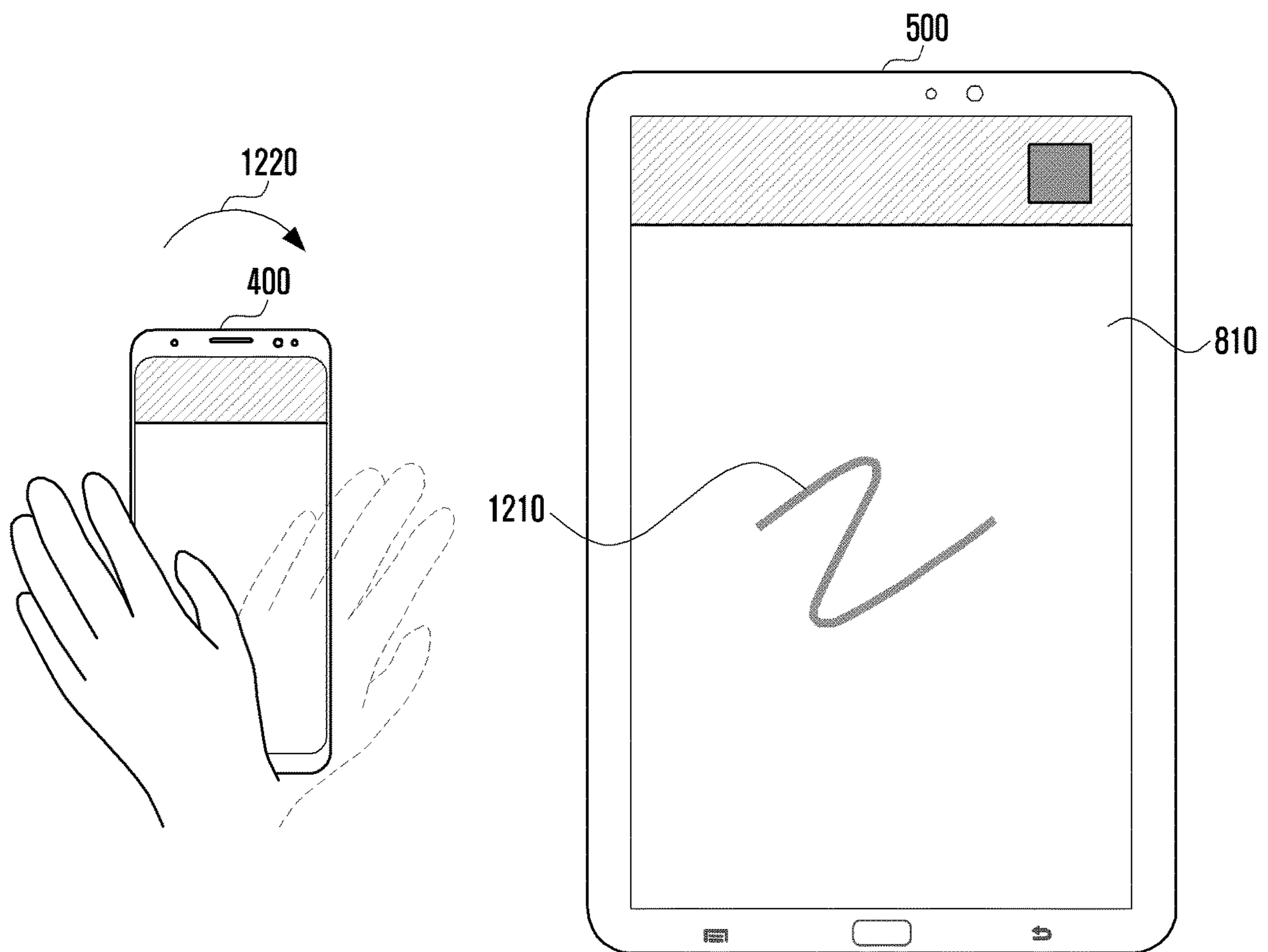


FIG. 12C

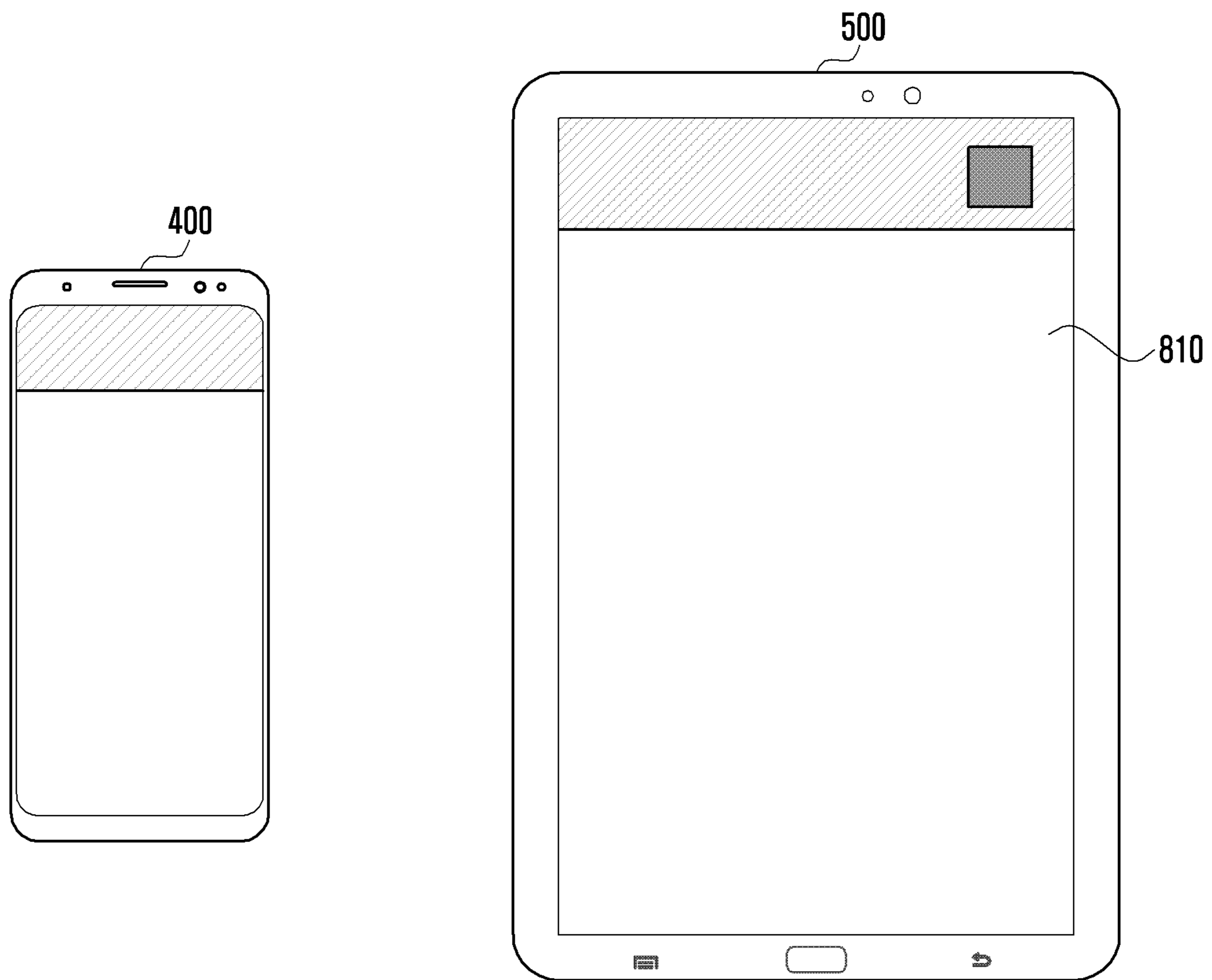


FIG. 13A

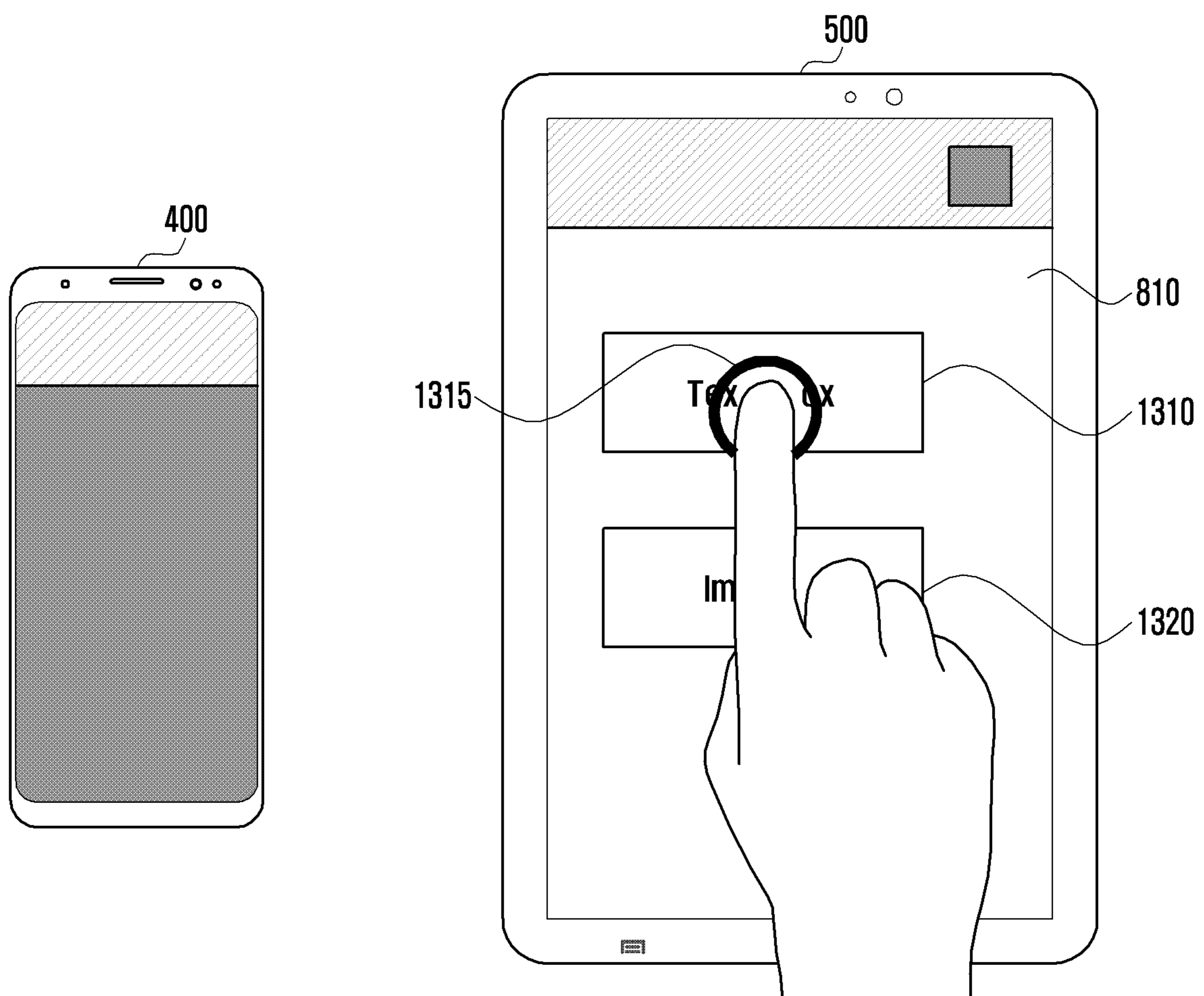


FIG. 13B

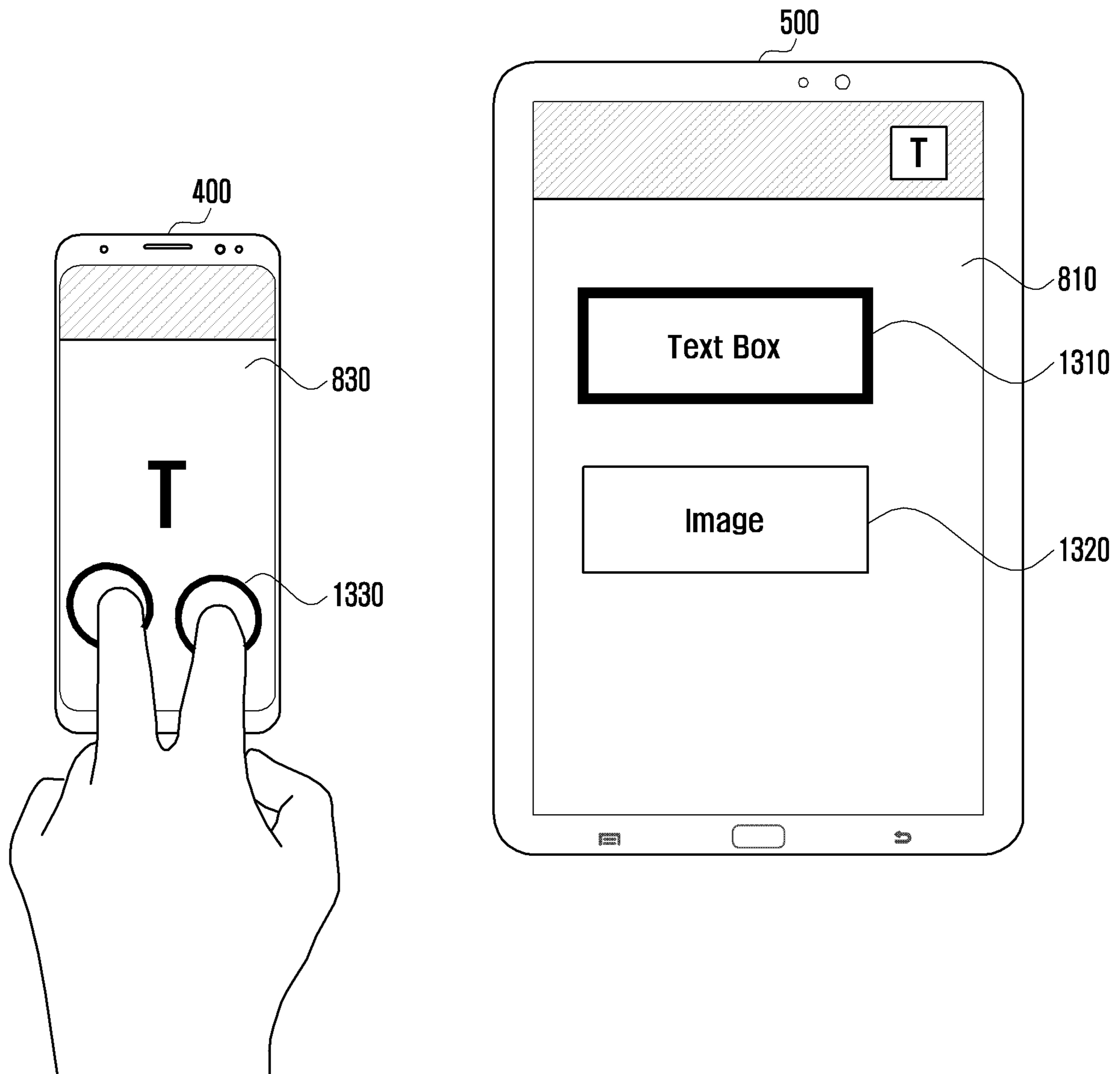


FIG. 13C

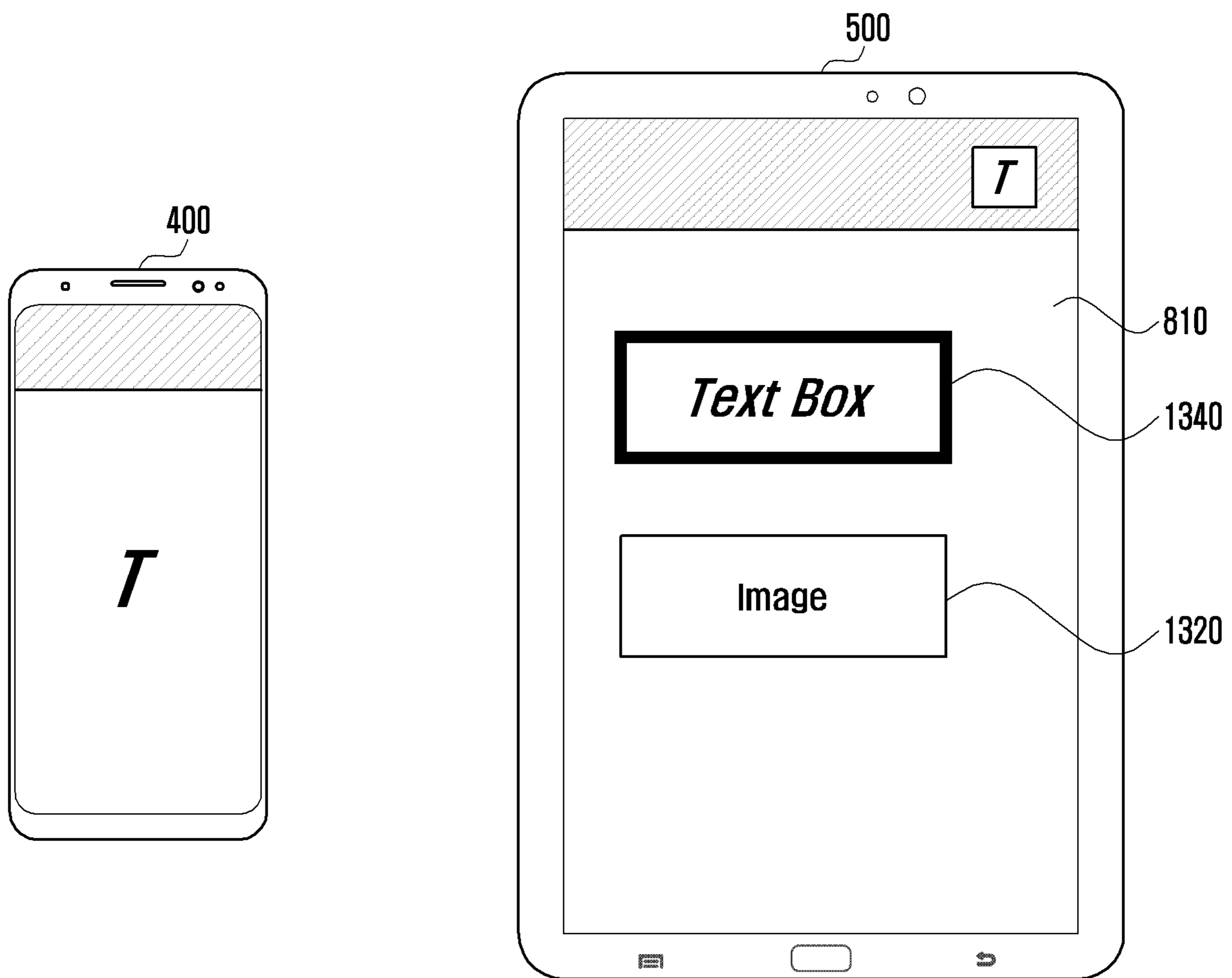


FIG. 14A

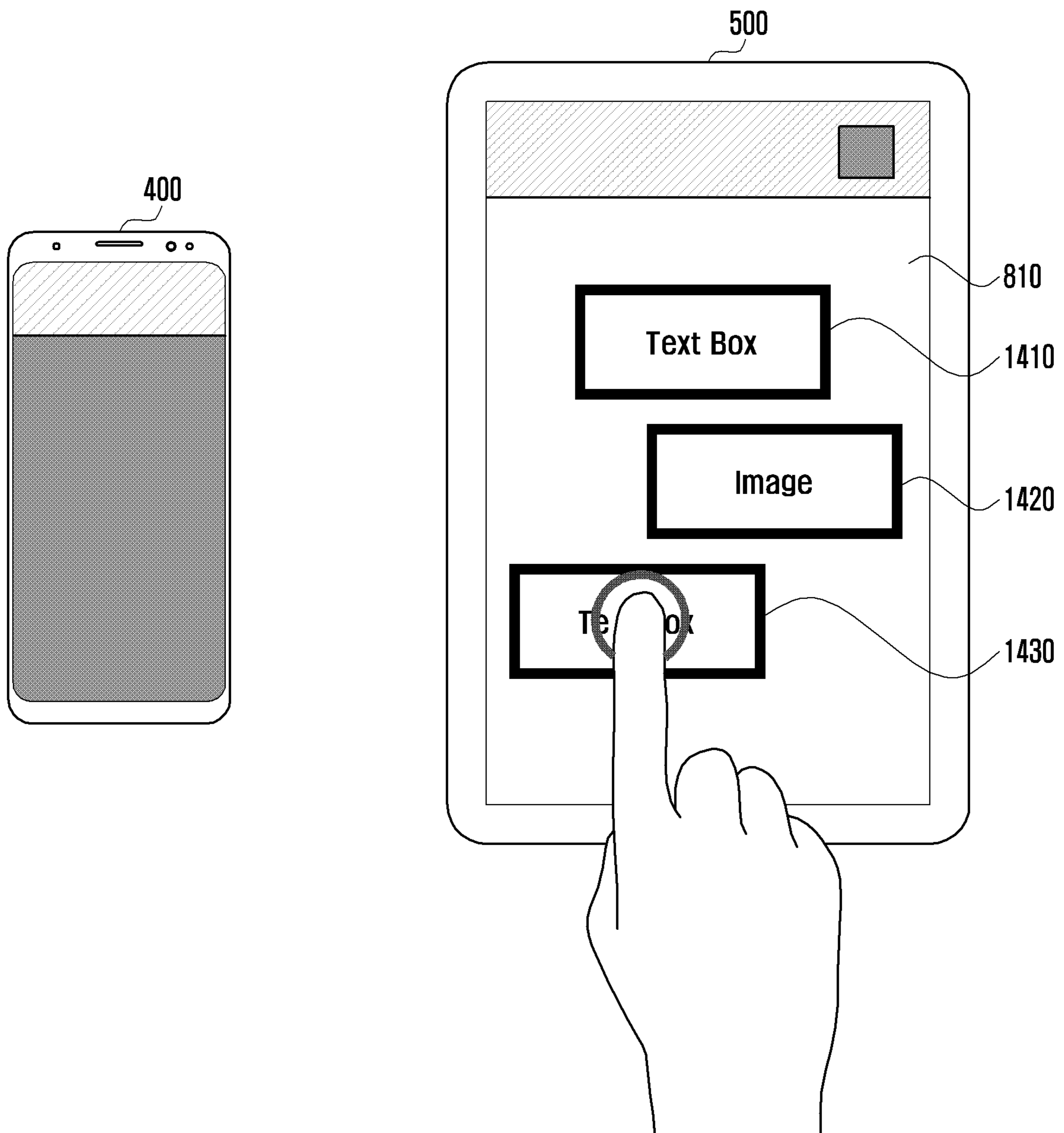


FIG. 14B

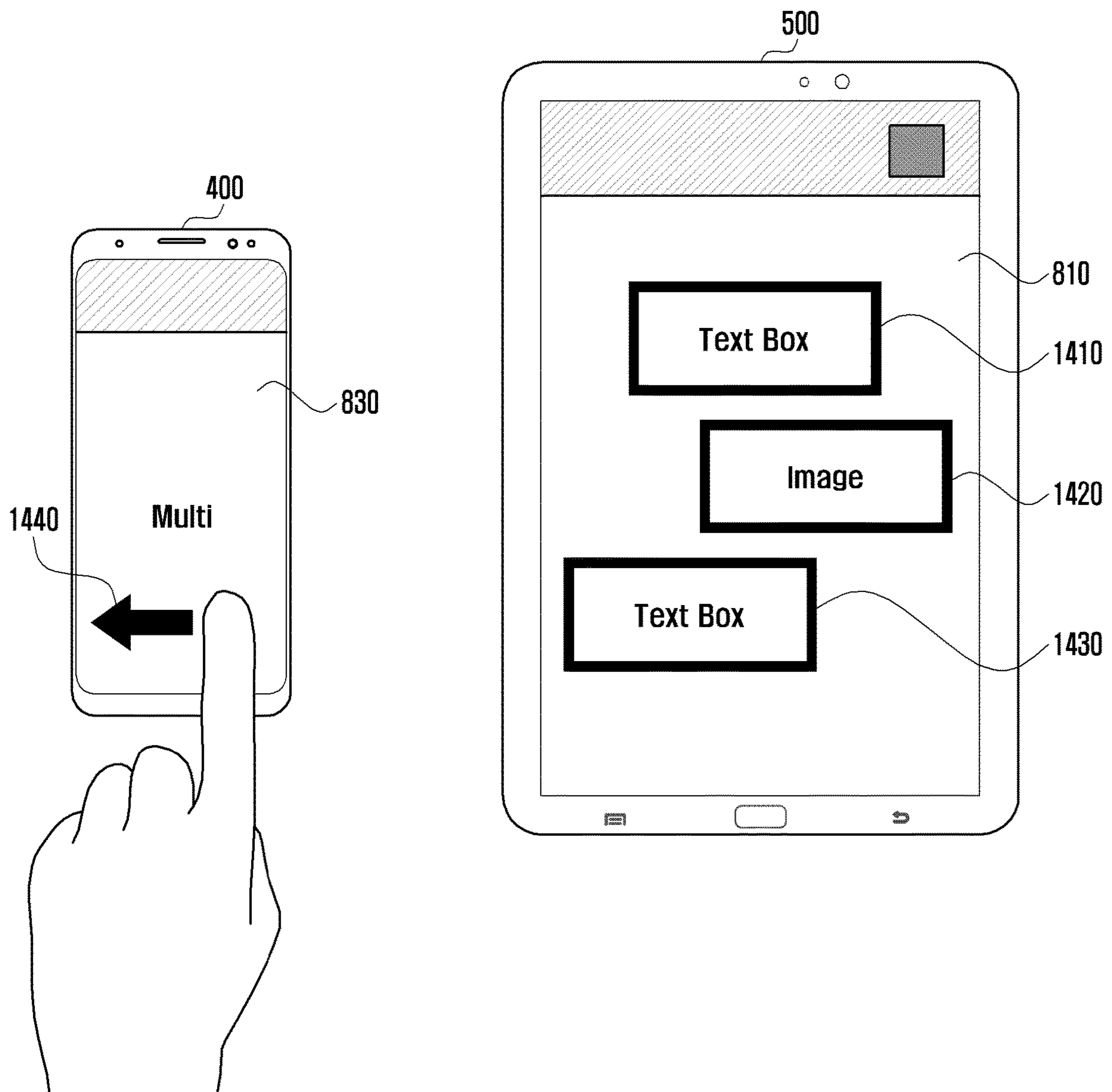


FIG. 14C

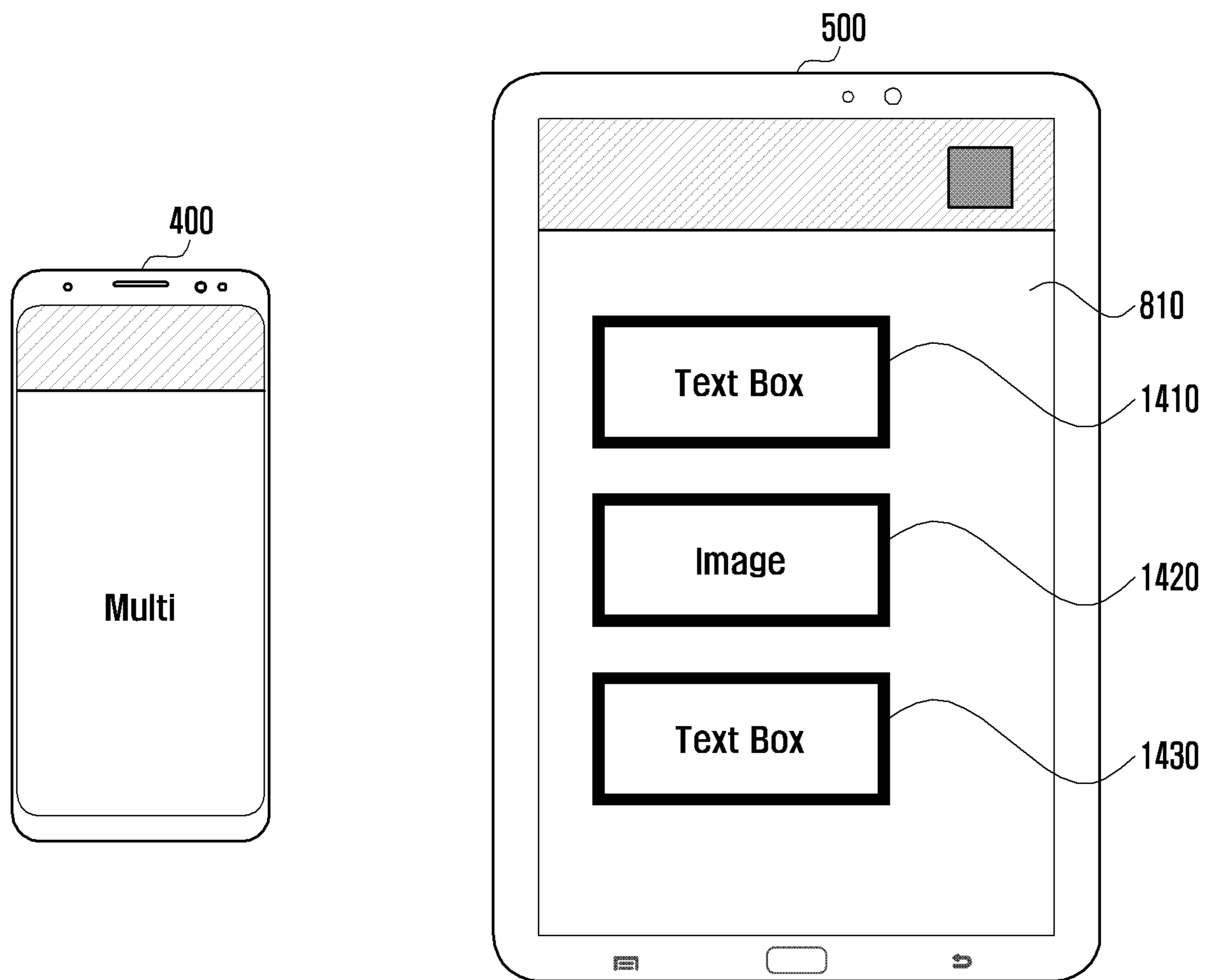


FIG. 15A

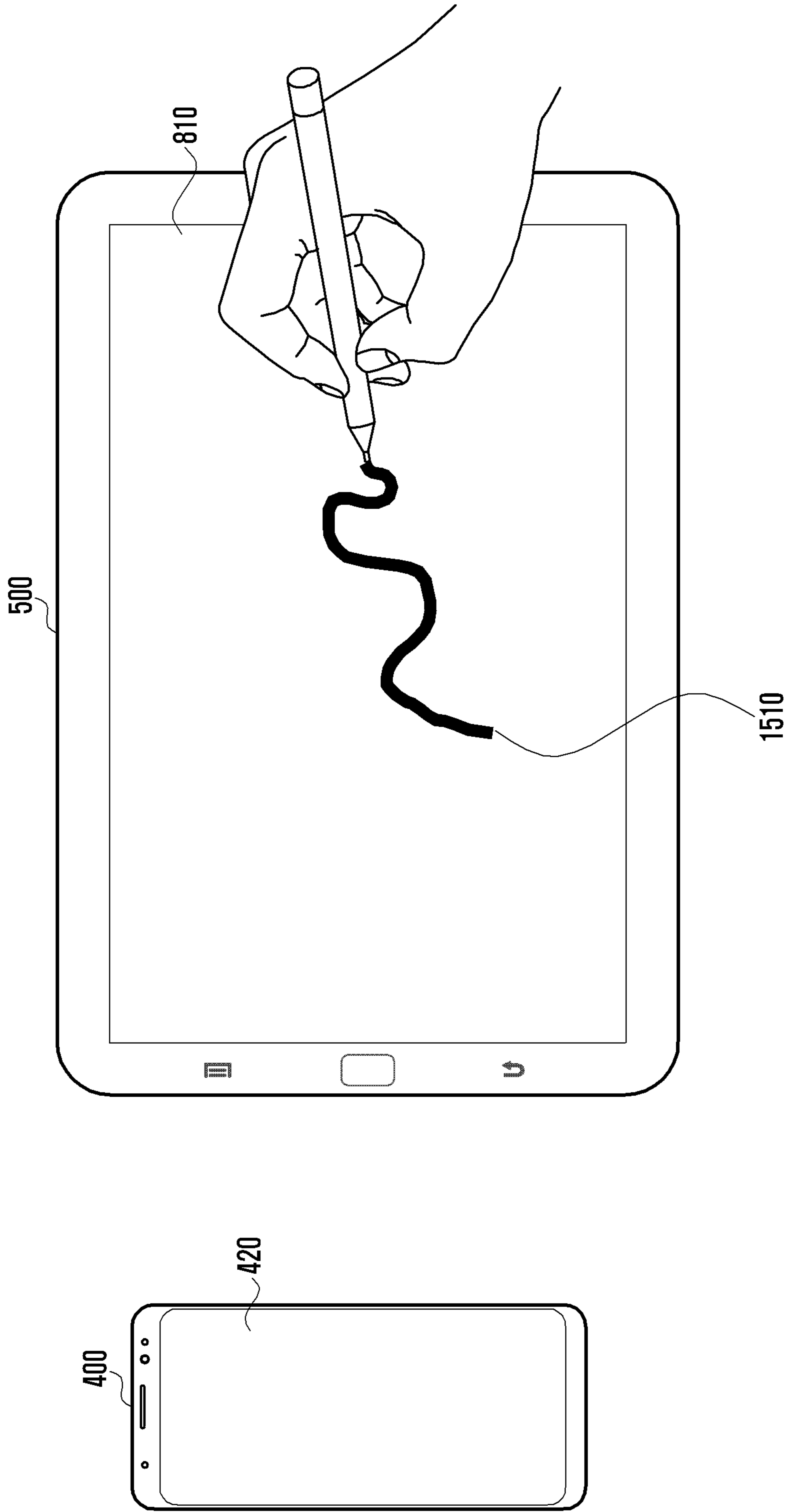


FIG. 15B

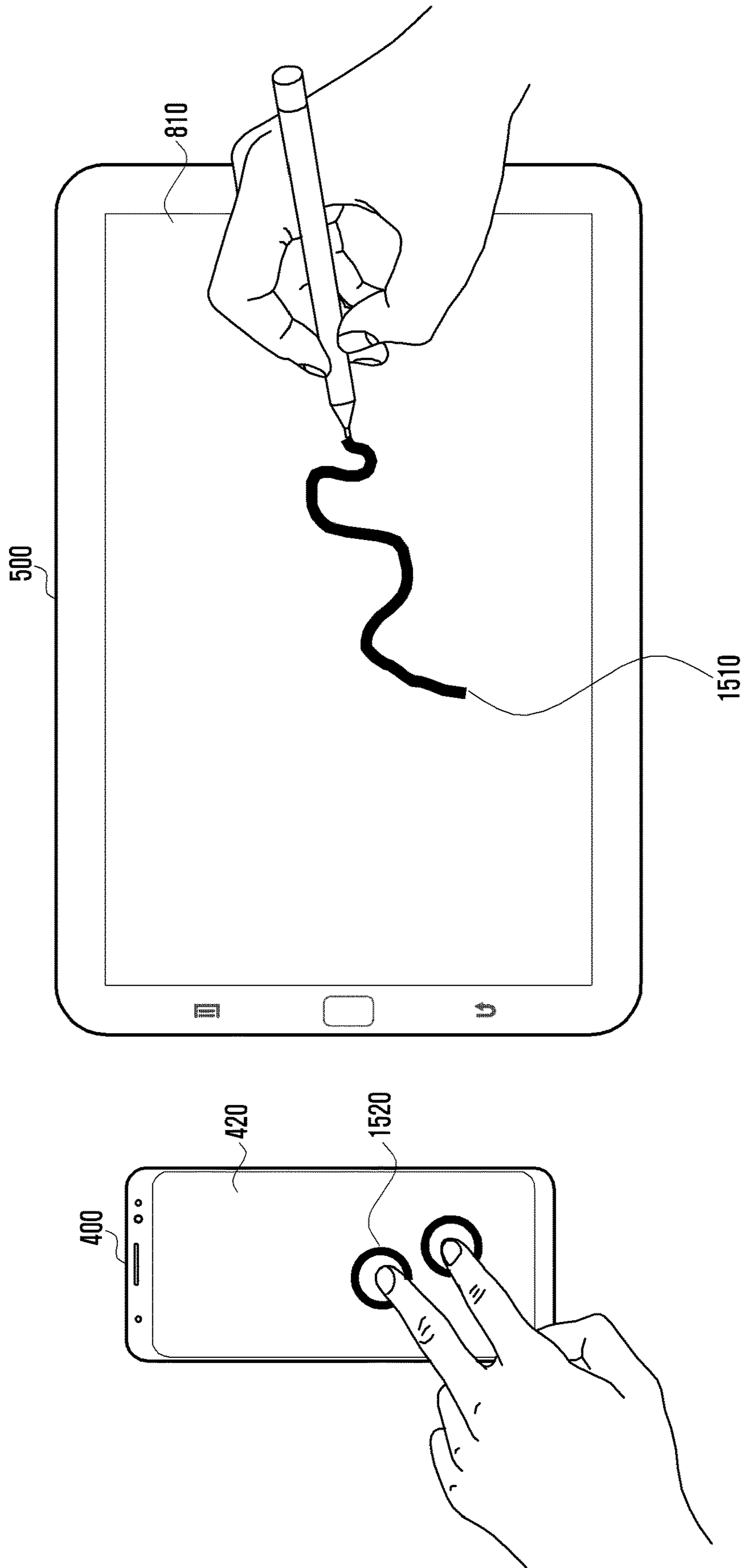


FIG. 15C

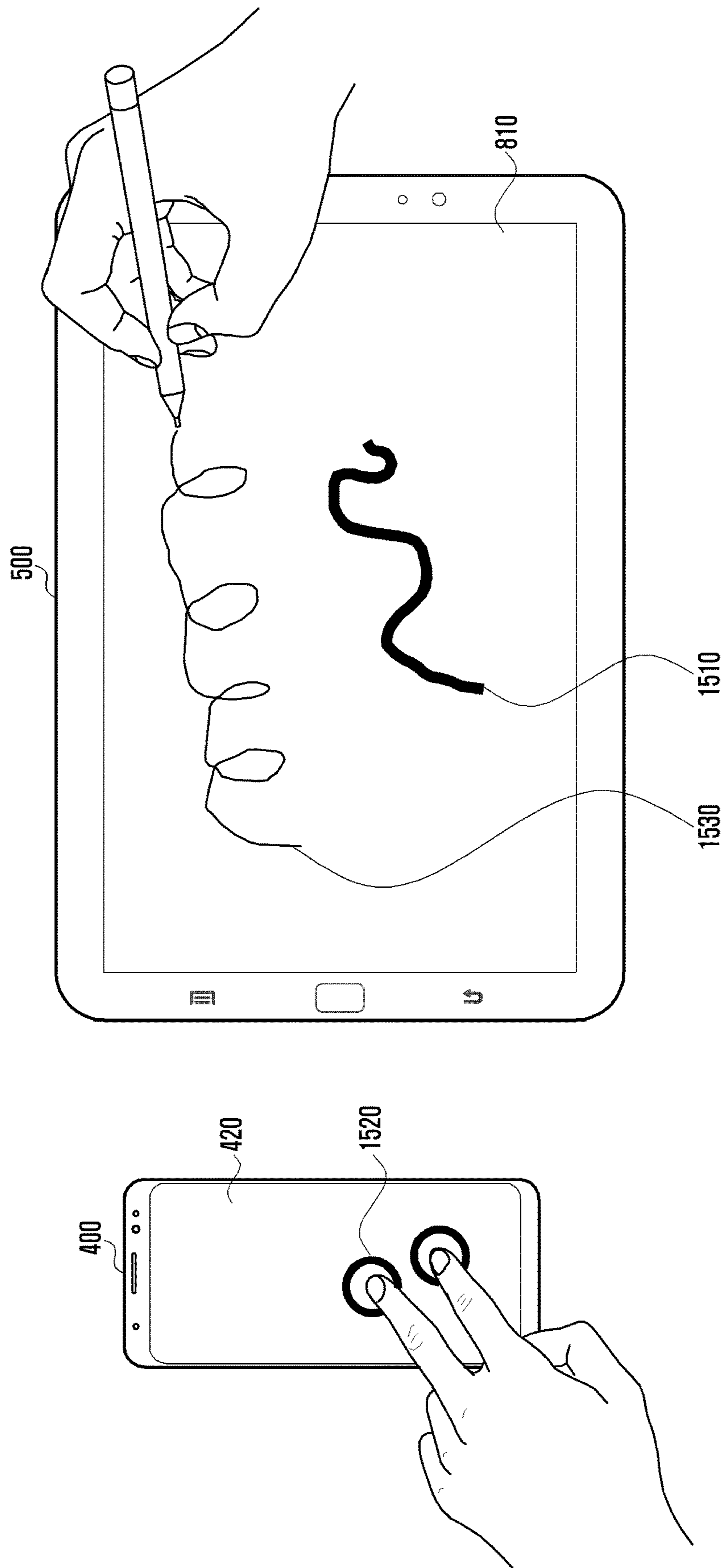


FIG. 15D

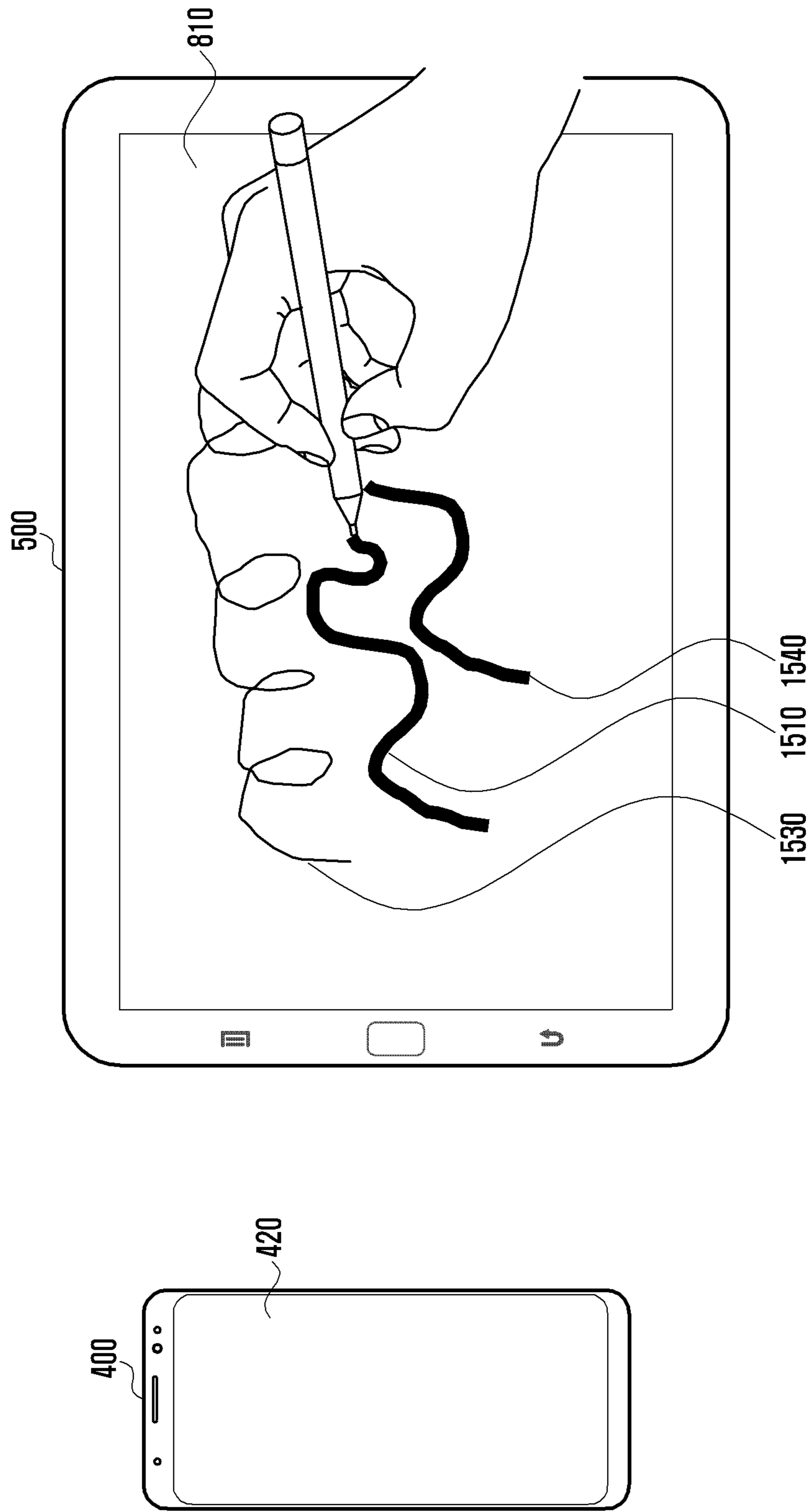


FIG. 16A

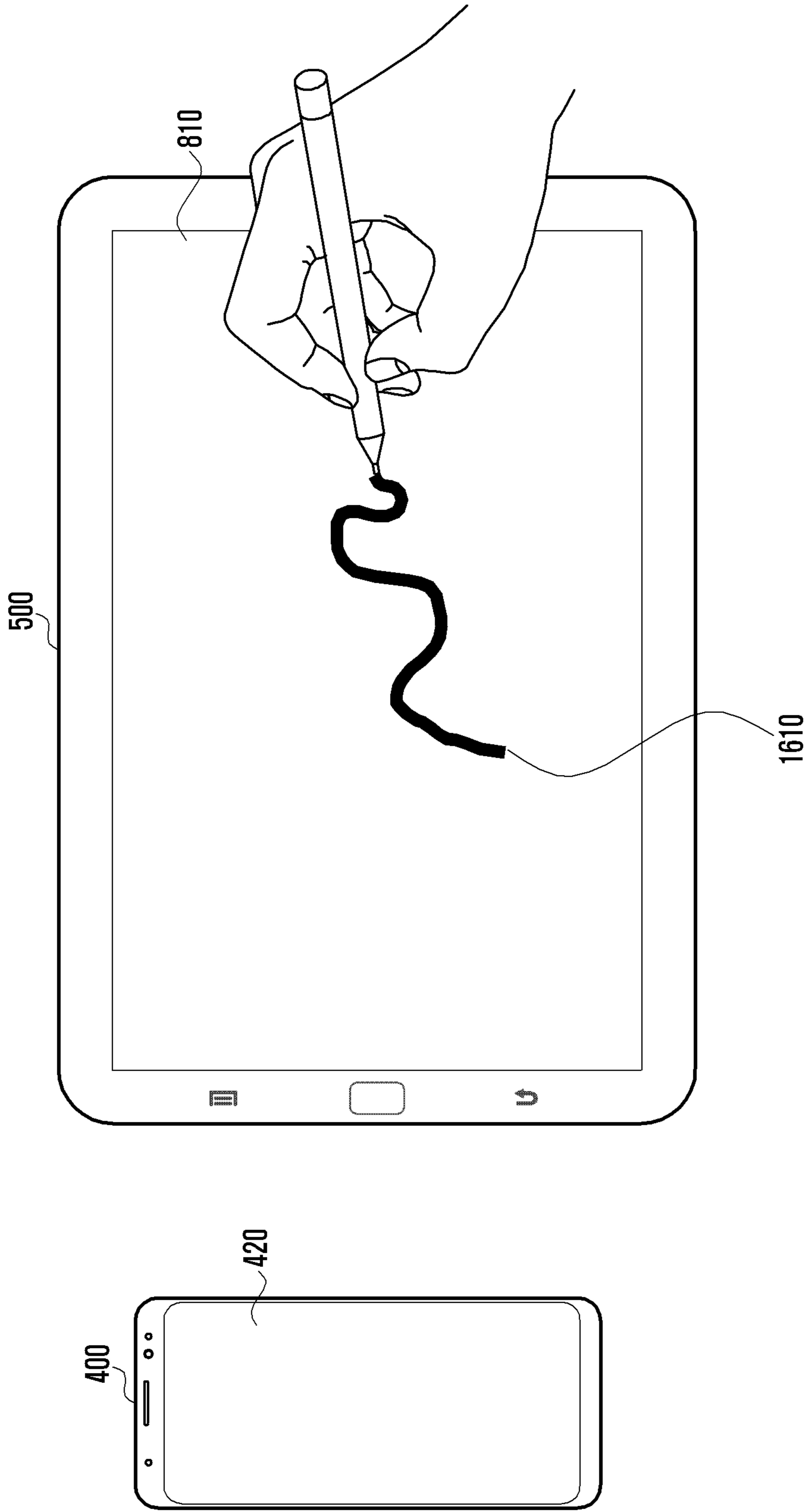


FIG. 16B

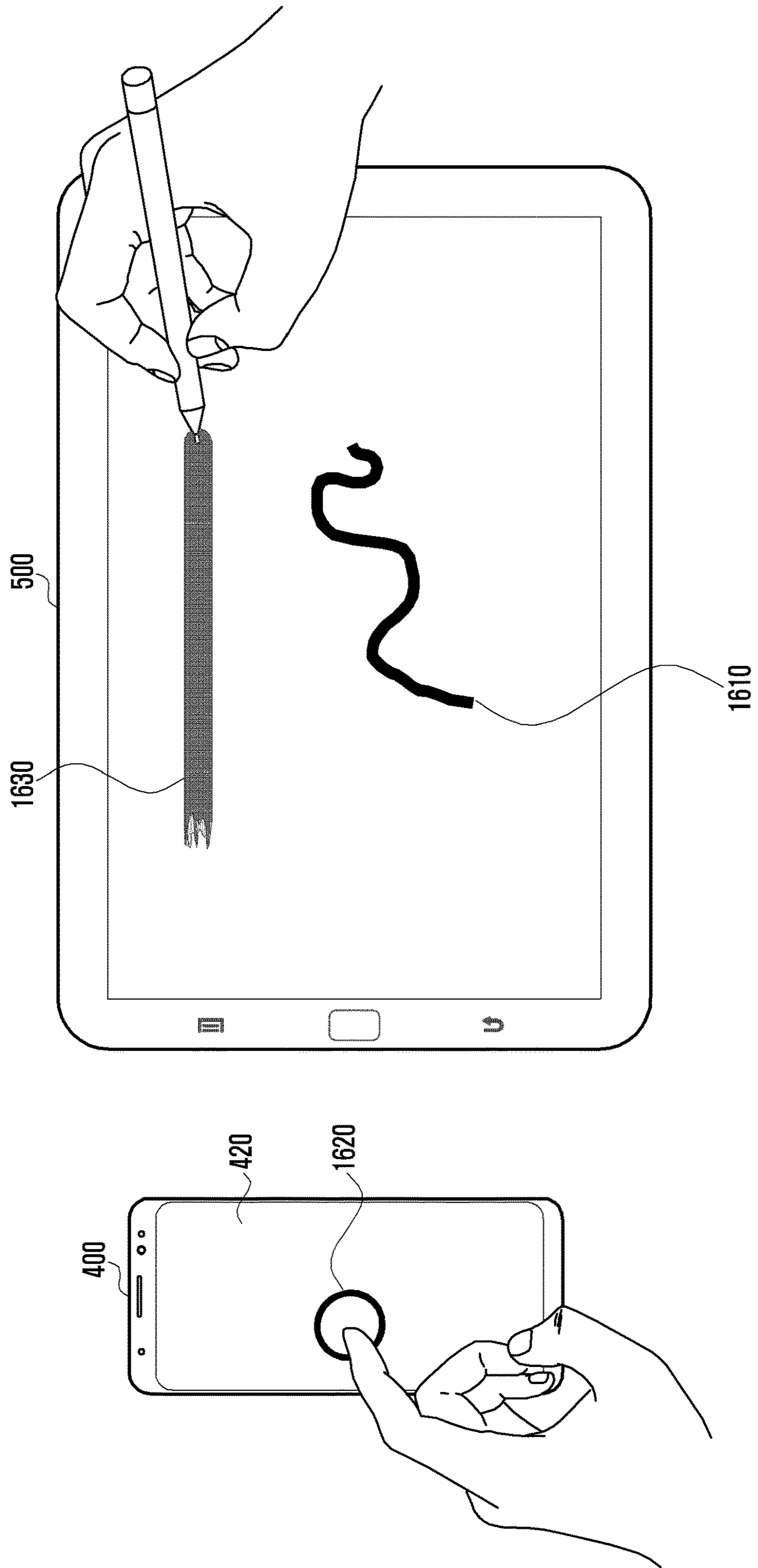


FIG. 16C

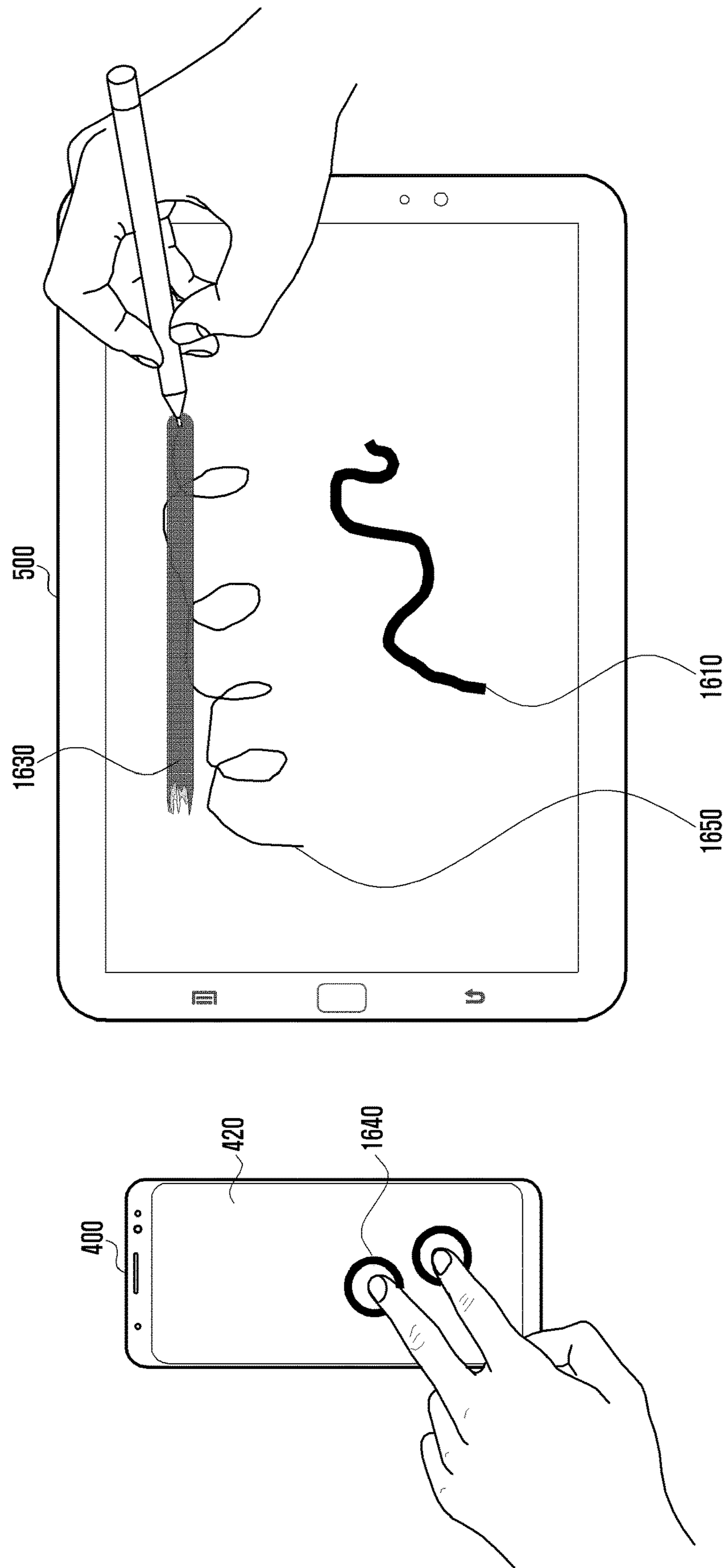


FIG. 16D

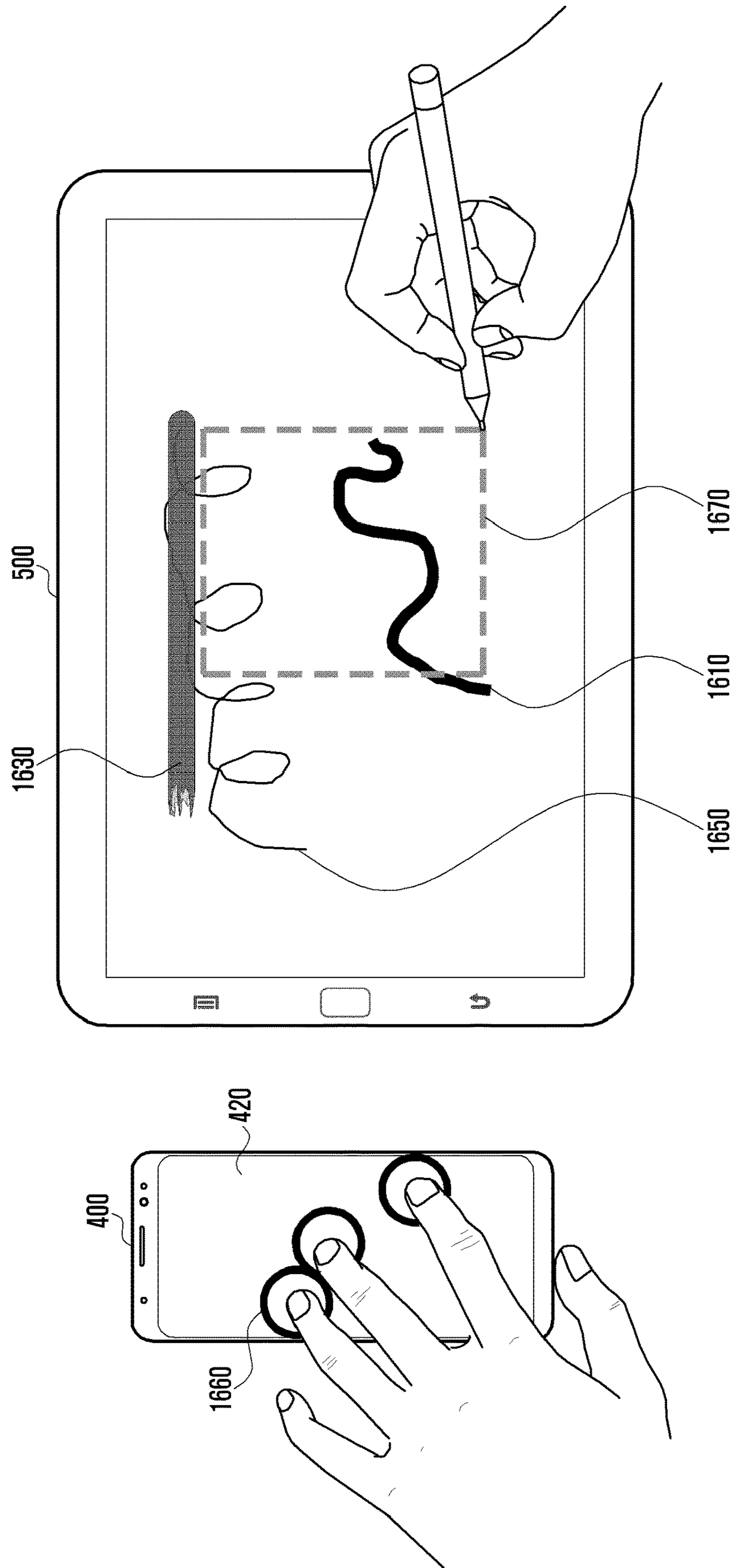


FIG. 17A

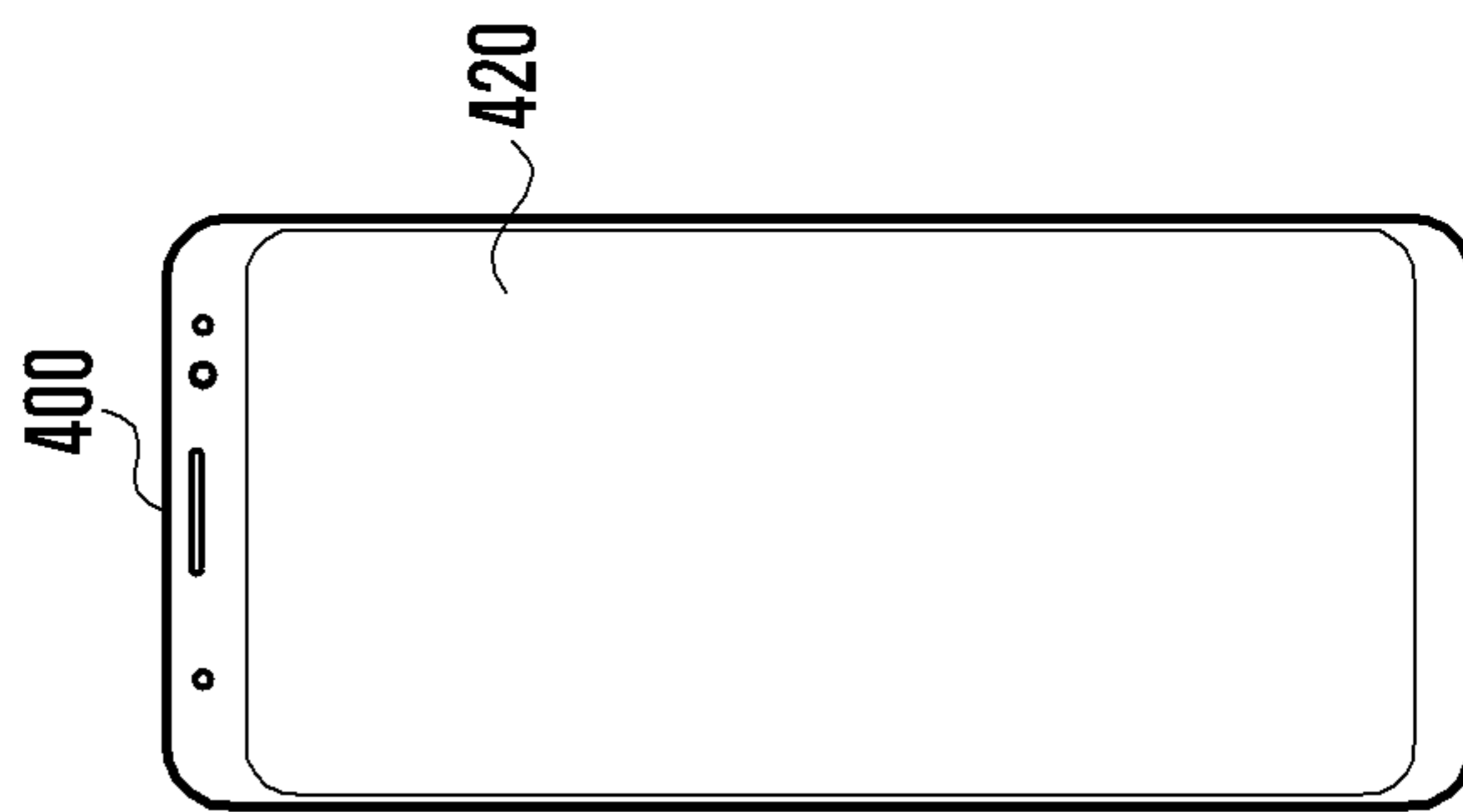
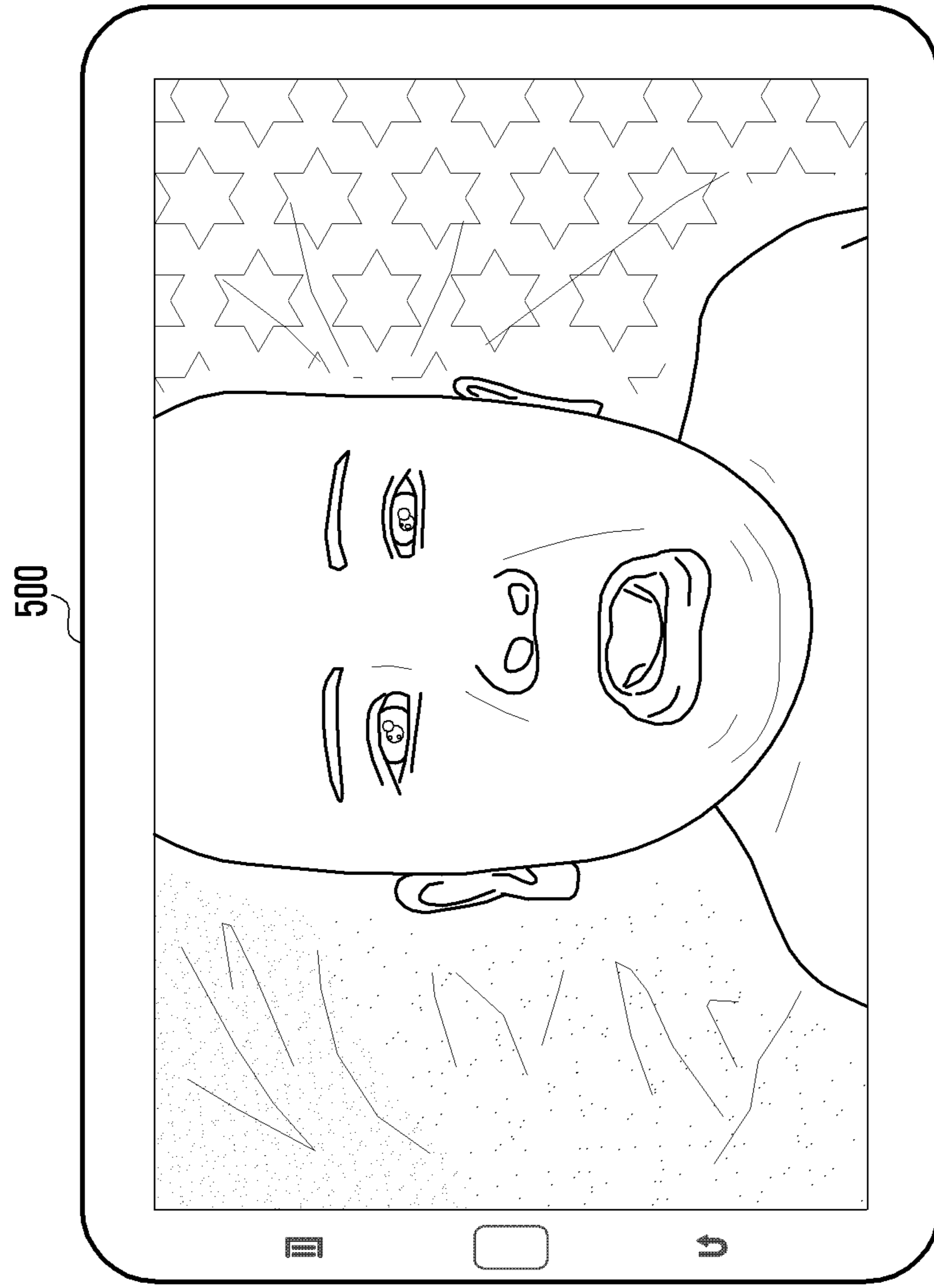


FIG. 17B

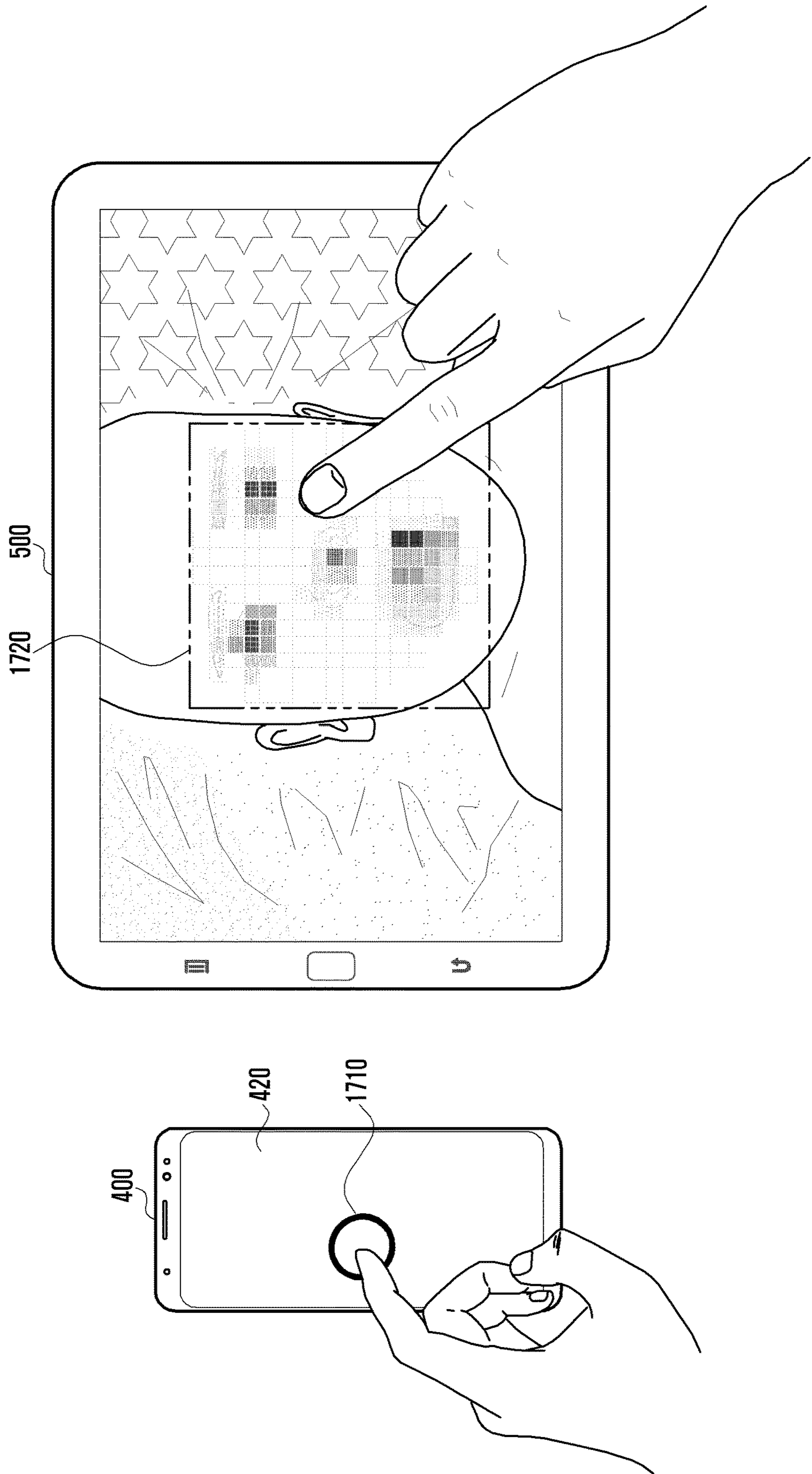


FIG. 17C

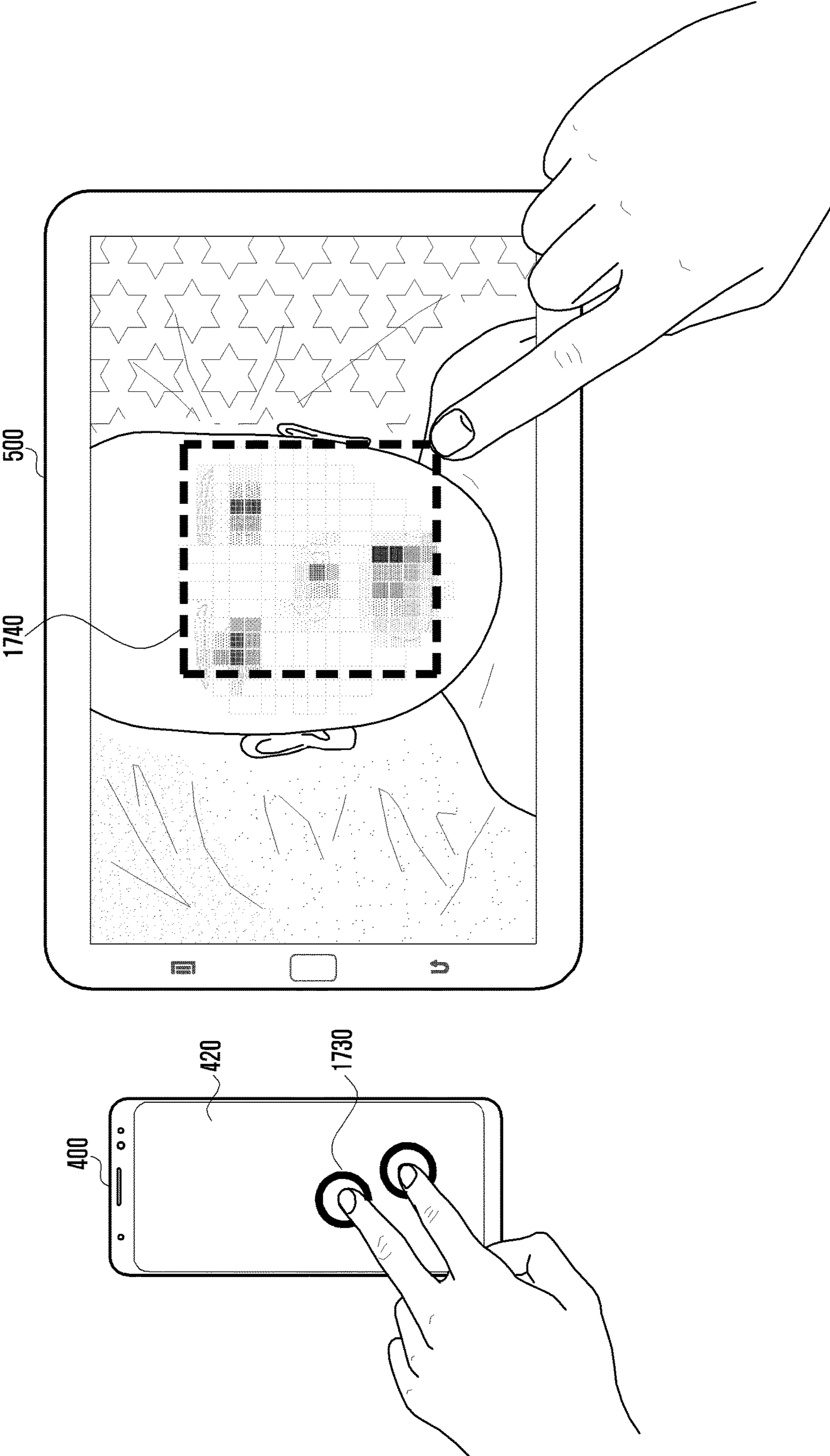


FIG. 18A

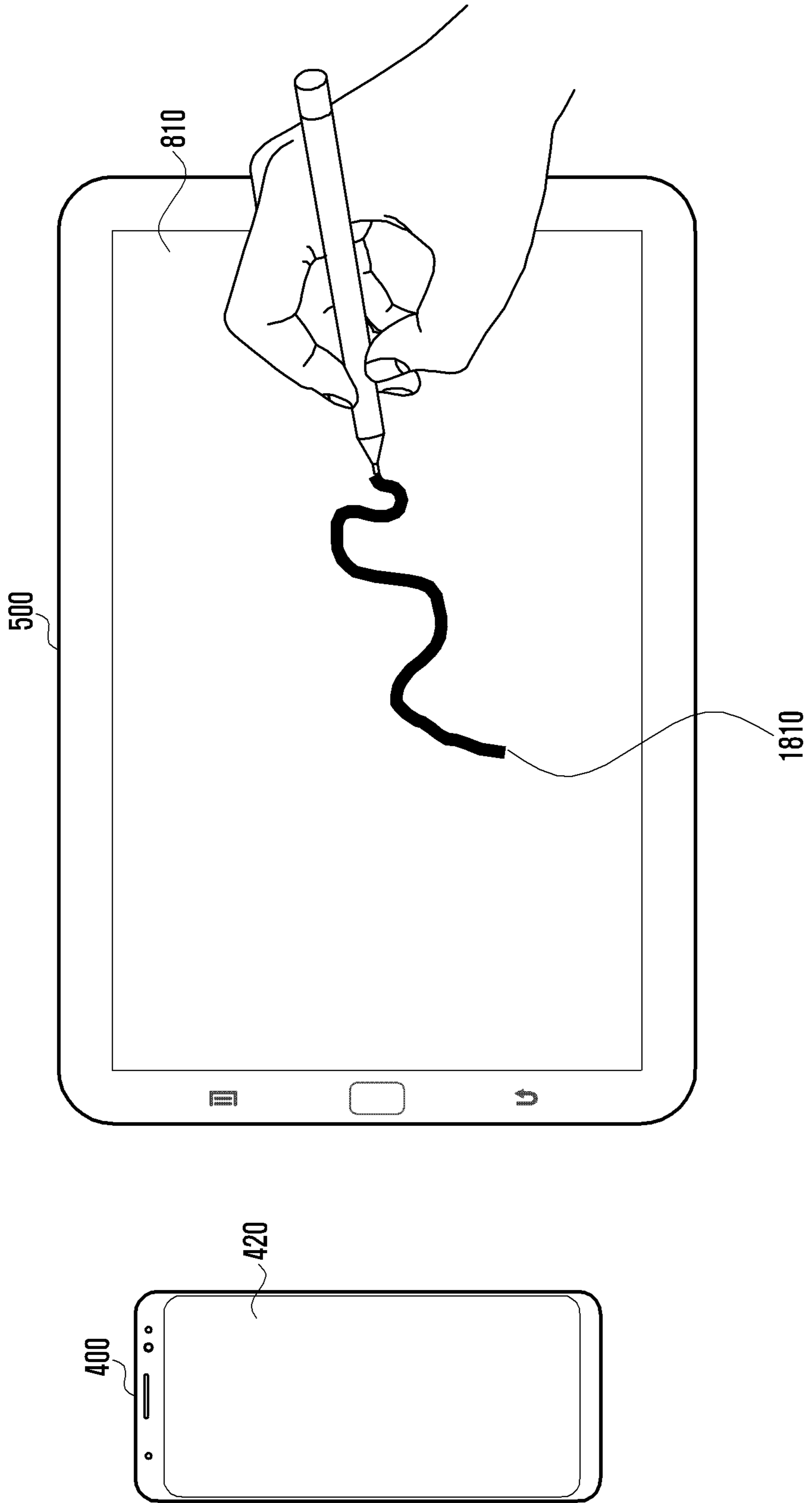


FIG. 18B

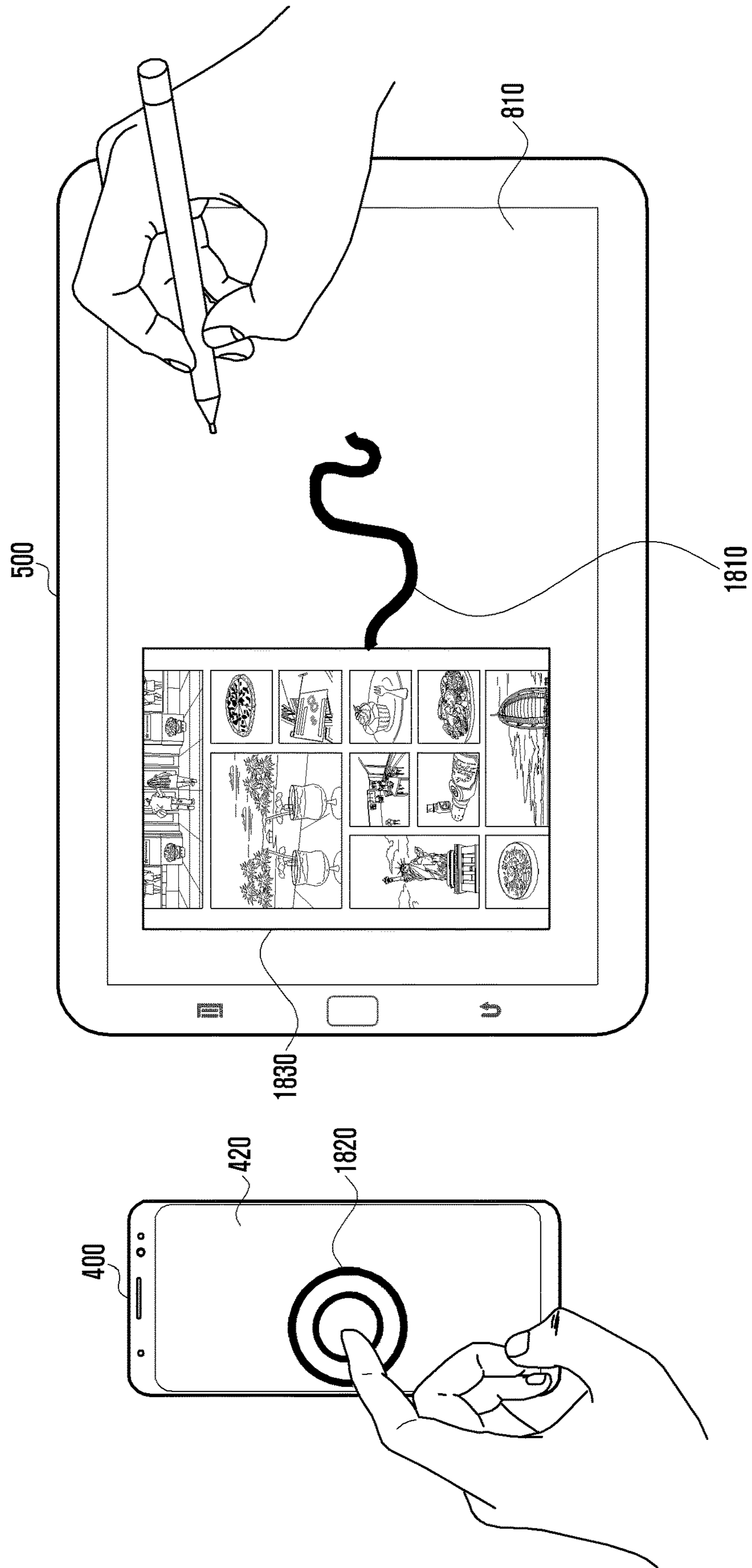


FIG. 18C

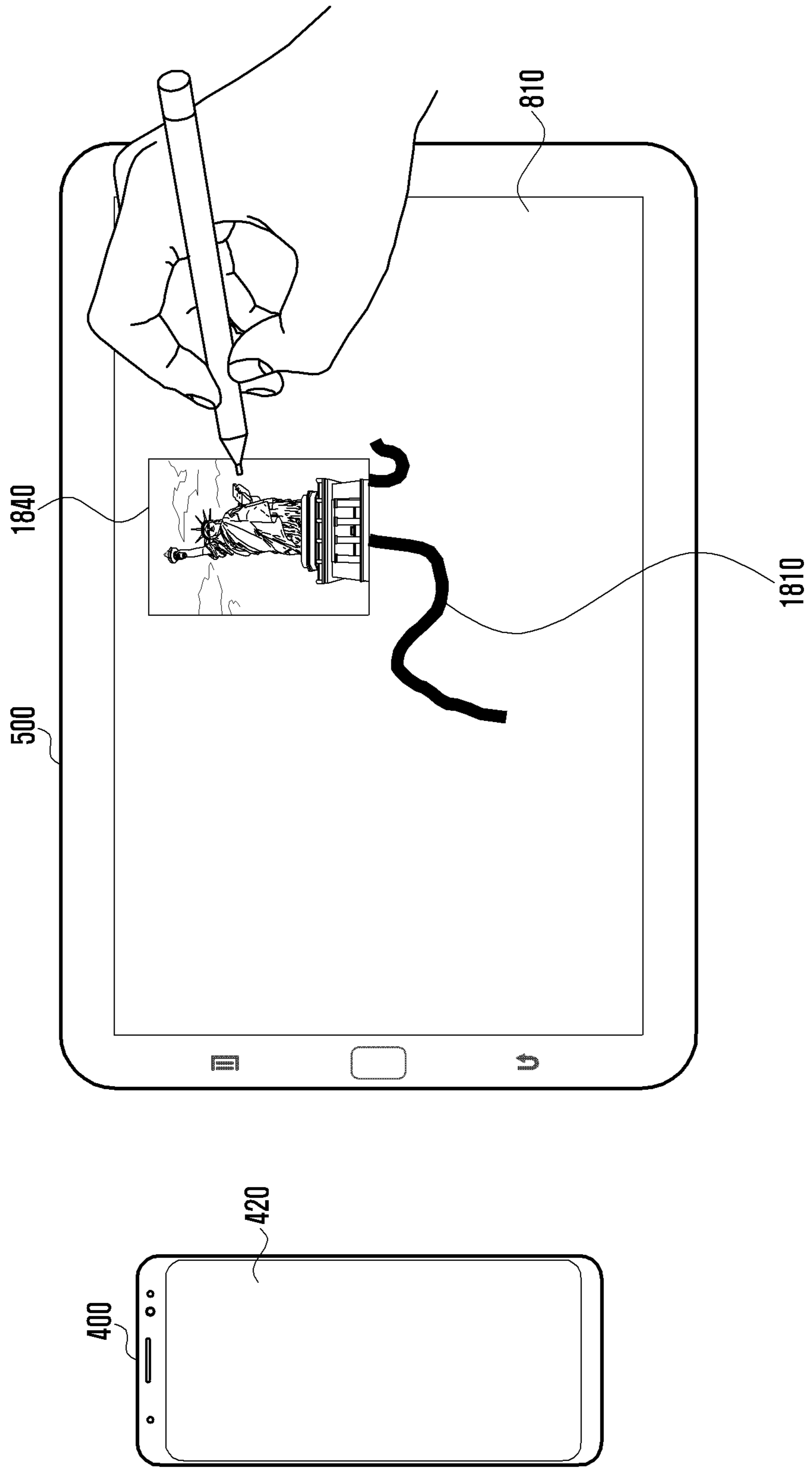


FIG. 19A

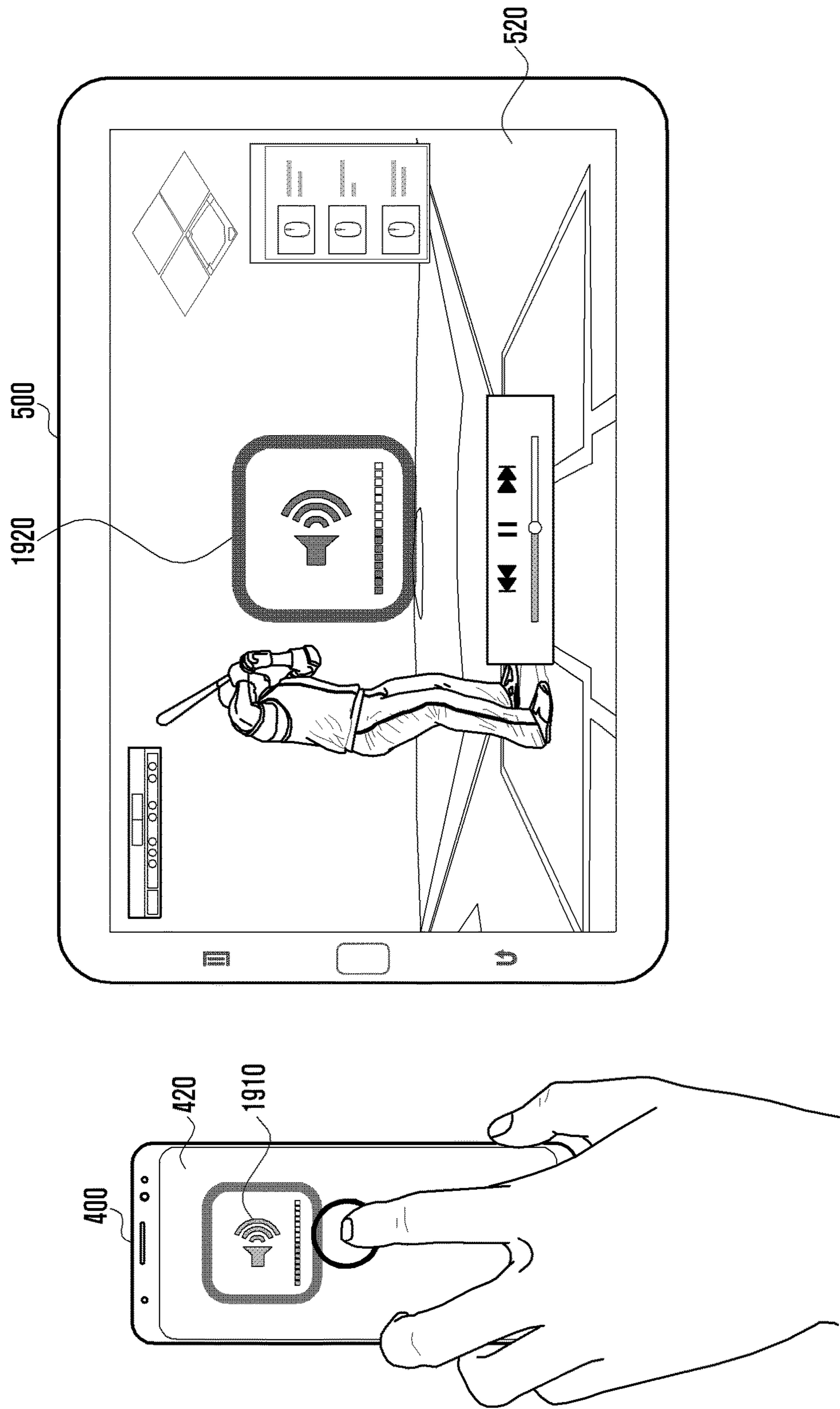


FIG. 19B

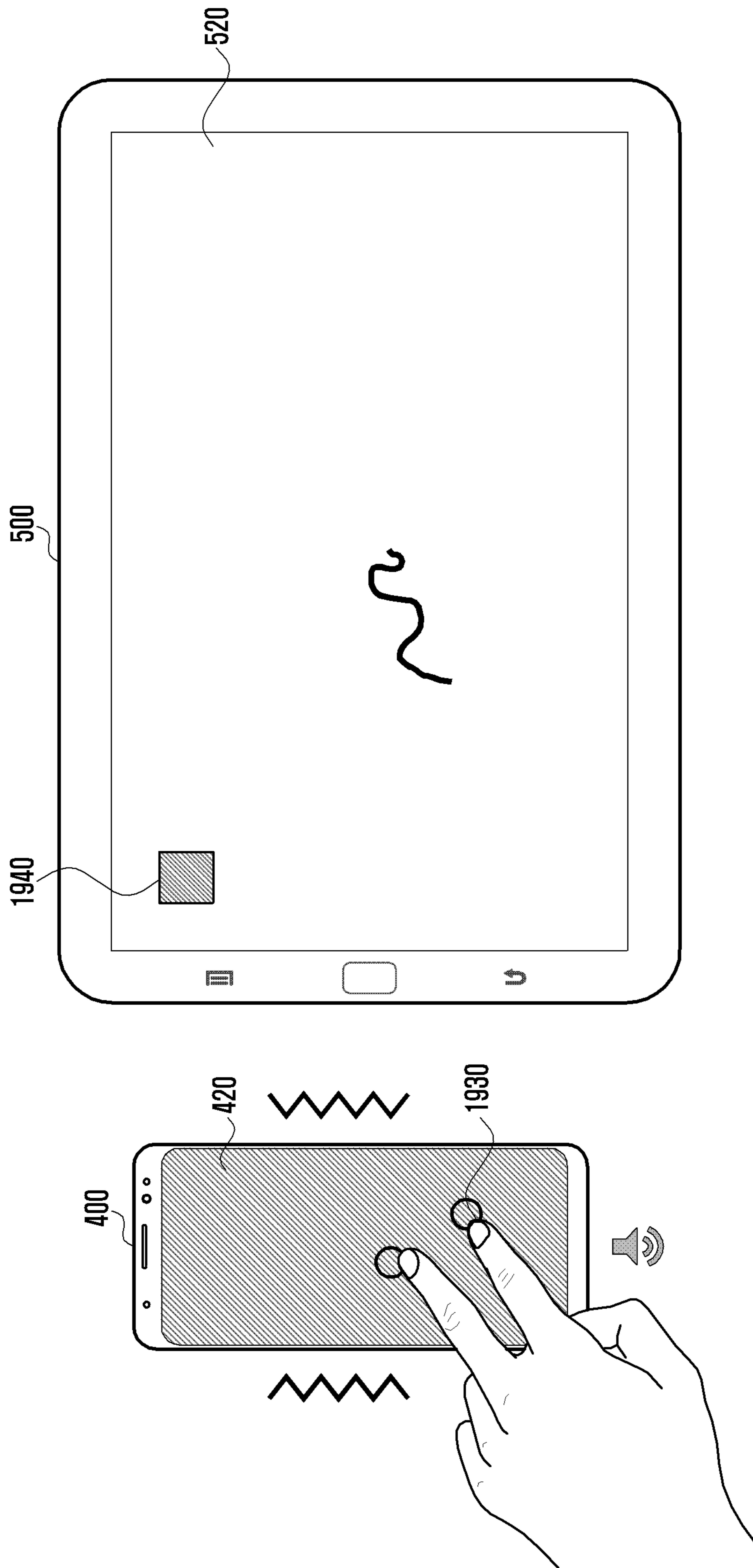


FIG. 20

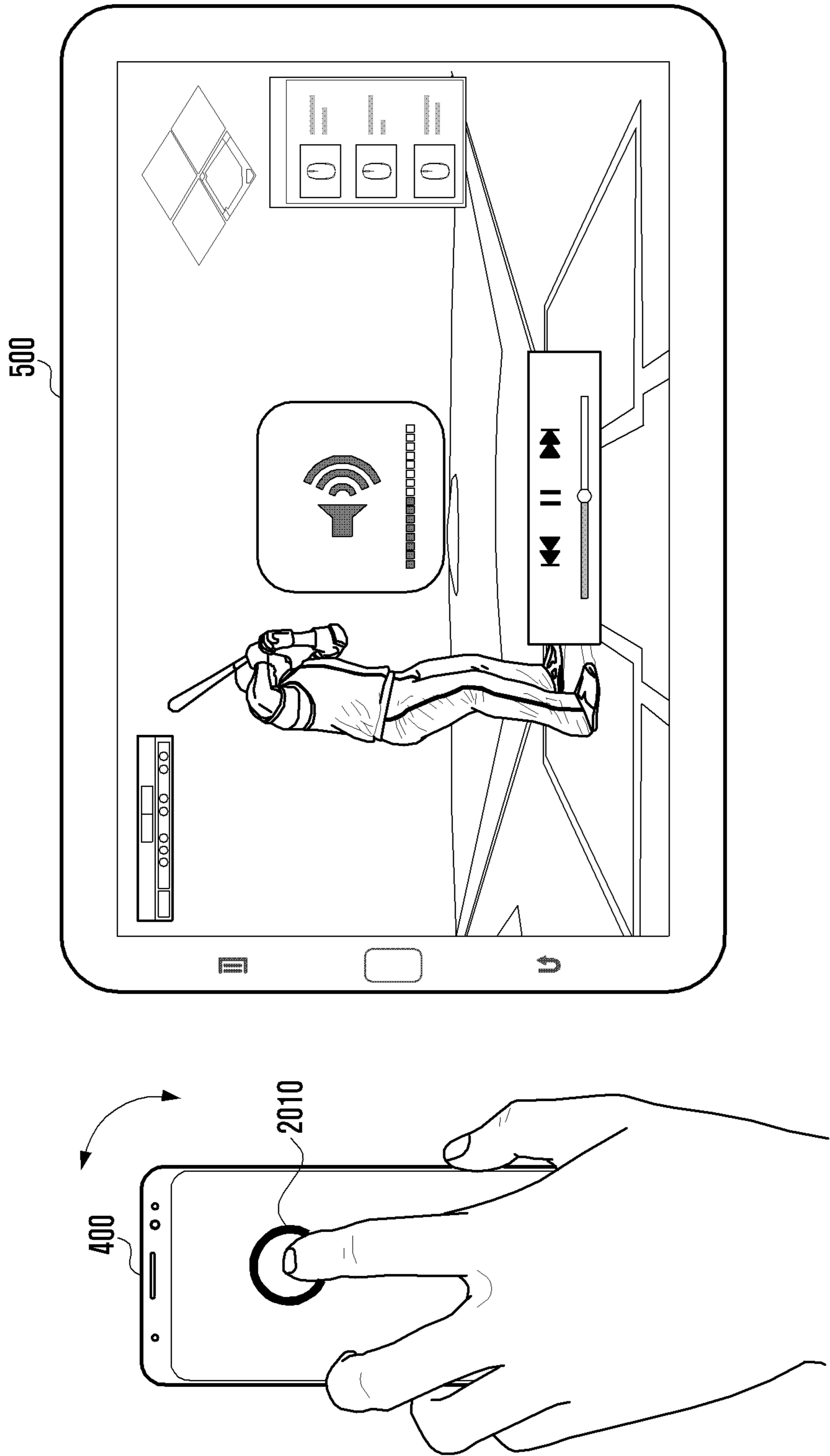
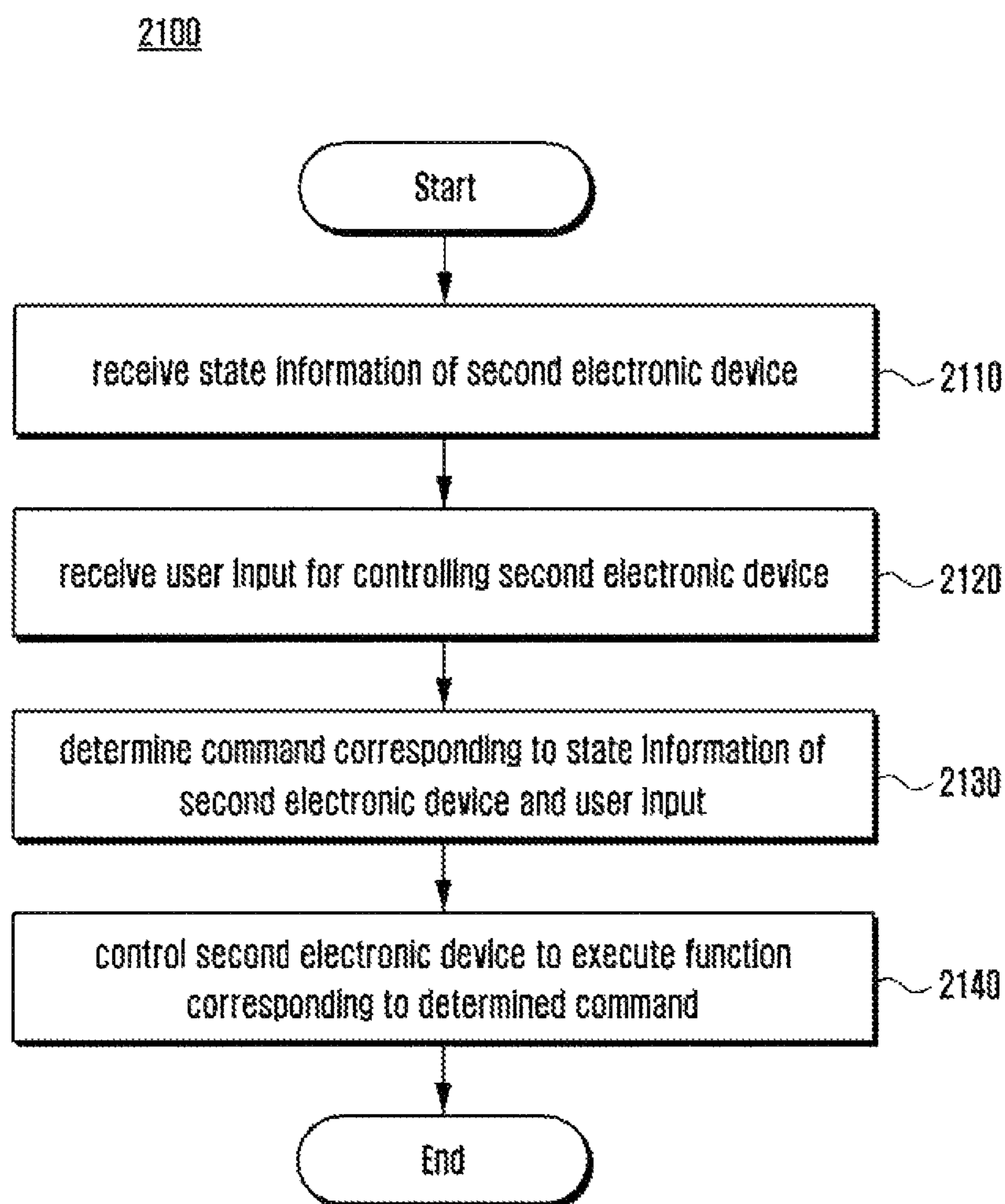


FIG. 21



1

**ELECTRONIC DEVICE, EXTERNAL
ELECTRONIC DEVICE, AND METHOD FOR
CONTROLLING EXTERNAL ELECTRONIC
DEVICE BY USING ELECTRONIC DEVICE**

CROSS-REFERENCE TO RELATED
APPLICATION(S)

This application is a National Phase Entry of PCT International Application No. PCT/KR2019/009267, which was filed on Jul. 25, 2019 and claims priority to Korean Patent Application No. 10-2018-0120623, which was filed on Oct. 10, 2018, the contents of which are incorporated herein by reference.

TECHNICAL FIELD

Various embodiments of the disclosure relate to a technology for controlling an external electronic device connected to an electronic device as a method of operating the external electronic device and the electronic device.

BACKGROUND ART

Various electronic devices such as a smartphone, tablet PC, portable multimedia player (PMP), personal digital assistant (PDA), laptop personal computer (laptop PC) and wearable device are being spread.

Recently, as electronic devices having a large screen (e.g., tablet PCs) become popular, a user of an electronic device can produce a piece of content by using the electronic device.

Various applications (e.g., drawing application) including applications that can be used to create content on an electronic device (e.g., writing application, drawing application, or image editing application) may include a first region for receiving a user input (e.g., drawing input) and outputting a result (e.g., line or figure) corresponding to the user input and a second region that displays one or more graphical user interface (GUI) objects (e.g., object implemented in the form of a button GUI) for controlling various functions related to the user input. The user may fix their gaze on the first region while performing a user input, and then the user may shift his gaze to the second region in order to control the function related to the user input, select one of various objects included in the second region, and execute or change a function corresponding to the selected object.

DISCLOSURE OF INVENTION

Technical Problem

When the user fixes their gaze on the first region while entering a user input and then shifts their gaze to the second region in order to control the function related to the user input, the work of the user is interrupted. This method described above may reduce the user's content production efficiency.

Additionally, in an electronic device having a touch-screen, to implement the first region and the second region on a display having a limited size, objects included in the second region are layered. These layered objects may cause a phenomenon in which user input must be repeatedly entered to select a function desired by the user. This phenomenon may reduce the user's content production efficiency.

2

Furthermore, when an electronic device is configured to perform a task by using separate input devices such as a mouse and a keyboard, the content production efficiency may be increased. That is, to efficiently produce content, separate input devices such as a mouse and a keyboard must be provided, but when such an input device is provided, the mobility of the user may be restricted. An electronic device according to various embodiments of the disclosure may receive state information of an external electronic device connected to the electronic device, determine a command corresponding to the state information of the external electronic device and a user input received by the electronic device, and control the external electronic device according to the determined command (e.g., controlling content production operations of the external electronic device).

Solution to Problem

An electronic device according to various embodiments of the disclosure may include: a communication module to transmit and receive data to and from an external electronic device; a display; a memory to store commands for executing, on the external electronic device, functions mapped to state information of the external electronic device and user inputs; and a processor, wherein the processor may be configured to: control the communication module to be connected to the external electronic device; receive first state information of the external electronic device from the external electronic device; receive a first user input on an arbitrary zone of the display; determine a first command corresponding to the first state information and a characteristic of the first user input among the commands stored in the memory; and control the external electronic device to execute a function corresponding to the first command.

An operation method of the electronic device according to various embodiments of the disclosure may include: connecting to an external electronic device; receiving first state information of the external electronic device from the external electronic device; receiving a first user input for an arbitrary zone on a display; determining a first command corresponding to the first state information and a characteristic of the first user input from among commands stored in a memory that stores commands for executing, on the external electronic device, functions mapped to state information of the external electronic device and user inputs; and controlling the external electronic device to execute a function corresponding to the first command.

Advantageous Effects of Invention

In an electronic device, an external electronic device, and an operation method of the electronic device according to various embodiments of the disclosure, state information of the external electronic device can be received and the external electronic device can be controlled according to the state information of the external electronic device and a user input received by the electronic device, which can prevent a phenomenon in which the user's gaze is shifted to a region including one or more objects for executing a function desired by the user. Hence, it is possible to increase the work efficiency of the user utilizing the external electronic device. In an electronic device, an external electronic device, and an operation method of the electronic device according to various embodiments of the disclosure, state information of the external electronic device can be received and the external electronic device can be controlled according to the state information of the external electronic device and a user

input received by the electronic device, so that function control using layered objects may not have to be performed and repetitive user input for function control can be reduced. Hence, it is possible to increase the work efficiency of the user utilizing the external electronic device.

In an electronic device, an external electronic device, and an operation method of the electronic device according to various embodiments of the disclosure, an external electronic device (e.g., smartphone) already owned by the user can be used without having an additional external input device, thereby increasing the user's work efficiency.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a block diagram of an electronic device according to various embodiments of the disclosure.

FIG. 2 is a block diagram of programs according to various embodiments.

FIG. 3 is a diagram illustrating a user input support system according to various embodiments of the disclosure.

FIG. 4 is a block diagram of a first electronic device according to various embodiments of the disclosure.

FIG. 5 is a block diagram of a second electronic device according to various embodiments of the disclosure.

FIG. 6 is a diagram illustrating a first embodiment between the first electronic device and the second electronic device according to various embodiments of the disclosure.

FIGS. 7A and 7B are diagrams illustrating a second embodiment between the first electronic device and the second electronic device according to various embodiments of the disclosure.

FIGS. 8 to 20 are diagrams illustrating embodiments of the first electronic device and the second electronic device according to various embodiments of the disclosure.

FIG. 21 is a diagram illustrating an operation method of the first electronic device according to various embodiments of the disclosure.

MODE FOR THE INVENTION

FIG. 1 is a block diagram illustrating an electronic device **101** in a network environment **100** according to various embodiments. Referring to FIG. 1, the electronic device **101** in the network environment **100** may communicate with an electronic device **102** via a first network **198** (e.g., a short-range wireless communication network), or an electronic device **104** or a server **108** via a second network **199** (e.g., a long-range wireless communication network). According to an embodiment, the electronic device **101** may communicate with the electronic device **104** via the server **108**. According to an embodiment, the electronic device **101** may include a processor **120**, memory **130**, an input device **150**, a sound output device **155**, a display device **160**, an audio module **170**, a sensor module **176**, an interface **177**, a haptic module **179**, a camera module **180**, a power management module **188**, a battery **189**, a communication module **190**, a subscriber identification module (SIM) **196**, or an antenna module **197**. In some embodiments, at least one (e.g., the display device **160** or the camera module **180**) of the components may be omitted from the electronic device **101**, or one or more other components may be added in the electronic device **101**. In some embodiments, some of the components may be implemented as single integrated circuitry. For example, the sensor module **176** (e.g., a fingerprint sensor, an iris sensor, or an illuminance sensor) may be implemented as embedded in the display device **160** (e.g., a display).

The processor **120** may execute, for example, software (e.g., a program **140**) to control at least one other component (e.g., a hardware or software component) of the electronic device **101** coupled with the processor **120**, and may perform various data processing or computation. According to one embodiment, as at least part of the data processing or computation, the processor **120** may load a command or data received from another component (e.g., the sensor module **176** or the communication module **190**) in volatile memory **132**, process the command or the data stored in the volatile memory **132**, and store resulting data in non-volatile memory **134**. According to an embodiment, the processor **120** may include a main processor **121** (e.g., a central processing unit (CPU) or an application processor (AP)), and an auxiliary processor **123** (e.g., a graphics processing unit (GPU), an image signal processor (ISP), a sensor hub processor, or a communication processor (CP)) that is operable independently from, or in conjunction with, the main processor **121**. Additionally or alternatively, the auxiliary processor **123** may be adapted to consume less power than the main processor **121**, or to be specific to a specified function. The auxiliary processor **123** may be implemented as separate from, or as part of the main processor **121**.

The auxiliary processor **123** may control at least some of functions or states related to at least one component (e.g., the display device **160**, the sensor module **176**, or the communication module **190**) among the components of the electronic device **101**, instead of the main processor **121** while the main processor **121** is in an inactive (e.g., sleep) state, or together with the main processor **121** while the main processor **121** is in an active state (e.g., executing an application). According to an embodiment, the auxiliary processor **123** (e.g., an image signal processor or a communication processor) may be implemented as part of another component (e.g., the camera module **180** or the communication module **190**) functionally related to the auxiliary processor **123**.

The memory **130** may store various data used by at least one component (e.g., the processor **120** or the sensor module **176**) of the electronic device **101**. The various data may include, for example, software (e.g., the program **140**) and input data or output data for a command related thereto. The memory **130** may include the volatile memory **132** or the non-volatile memory **134**.

The program **140** may be stored in the memory **130** as software, and may include, for example, an operating system (OS) **142**, middleware **144**, or an application **146**.

The input device **150** may receive a command or data to be used by other component (e.g., the processor **120**) of the electronic device **101**, from the outside (e.g., a user) of the electronic device **101**. The input device **150** may include, for example, a microphone, a mouse, a keyboard, or a digital pen (e.g., a stylus pen).

The sound output device **155** may output sound signals to the outside of the electronic device **101**. The sound output device **155** may include, for example, a speaker or a receiver. The speaker may be used for general purposes, such as playing multimedia or playing record, and the receiver may be used for an incoming calls. According to an embodiment, the receiver may be implemented as separate from, or as part of the speaker.

The display device **160** may visually provide information to the outside (e.g., a user) of the electronic device **101**. The display device **160** may include, for example, a display, a hologram device, or a projector and control circuitry to control a corresponding one of the display, hologram device, and projector. According to an embodiment, the display

5

device **160** may include touch circuitry adapted to detect a touch, or sensor circuitry (e.g., a pressure sensor) adapted to measure the intensity of force incurred by the touch.

The audio module **170** may convert a sound into an electrical signal and vice versa. According to an embodiment, the audio module **170** may obtain the sound via the input device **150**, or output the sound via the sound output device **155** or a headphone of an external electronic device (e.g., an electronic device **102**) directly (e.g., wiredly) or wirelessly coupled with the electronic device **101**.

The sensor module **176** may detect an operational state (e.g., power or temperature) of the electronic device **101** or an environmental state (e.g., a state of a user) external to the electronic device **101**, and then generate an electrical signal or data value corresponding to the detected state. According to an embodiment, the sensor module **176** may include, for example, a gesture sensor, a gyro sensor, an atmospheric pressure sensor, a magnetic sensor, an acceleration sensor, a grip sensor, a proximity sensor, a color sensor, an infrared (IR) sensor, a biometric sensor, a temperature sensor, a humidity sensor, or an illuminance sensor.

The interface **177** may support one or more specified protocols to be used for the electronic device **101** to be coupled with the external electronic device (e.g., the electronic device **102**) directly (e.g., wiredly) or wirelessly. According to an embodiment, the interface **177** may include, for example, a high definition multimedia interface (HDMI), a universal serial bus (USB) interface, a secure digital (SD) card interface, or an audio interface.

A connecting terminal **178** may include a connector via which the electronic device **101** may be physically connected with the external electronic device (e.g., the electronic device **102**). According to an embodiment, the connecting terminal **178** may include, for example, a HDMI connector, a USB connector, a SD card connector, or an audio connector (e.g., a headphone connector).

The haptic module **179** may convert an electrical signal into a mechanical stimulus (e.g., a vibration or a movement) or electrical stimulus which may be recognized by a user via his tactile sensation or kinesthetic sensation. According to an embodiment, the haptic module **179** may include, for example, a motor, a piezoelectric element, or an electric stimulator.

The camera module **180** may capture a still image or moving images. According to an embodiment, the camera module **180** may include one or more lenses, image sensors, image signal processors, or flashes.

The power management module **188** may manage power supplied to the electronic device **101**. According to one embodiment, the power management module **188** may be implemented as at least part of, for example, a power management integrated circuit (PMIC).

The battery **189** may supply power to at least one component of the electronic device **101**. According to an embodiment, the battery **189** may include, for example, a primary cell which is not rechargeable, a secondary cell which is rechargeable, or a fuel cell.

The communication module **190** may support establishing a direct (e.g., wired) communication channel or a wireless communication channel between the electronic device **101** and the external electronic device (e.g., the electronic device **102**, the electronic device **104**, or the server **108**) and performing communication via the established communication channel. The communication module **190** may include one or more communication processors that are operable independently from the processor **120** (e.g., the application processor (AP)) and supports a direct (e.g., wired) commu-

6

nication or a wireless communication. According to an embodiment, the communication module **190** may include a wireless communication module **192** (e.g., a cellular communication module, a short-range wireless communication module, or a global navigation satellite system (GNSS) communication module) or a wired communication module **194** (e.g., a local area network (LAN) communication module or a power line communication (PLC) module). A corresponding one of these communication modules may communicate with the external electronic device via the first network **198** (e.g., a short-range communication network, such as Bluetooth™, wireless-fidelity (Wi-Fi) direct, or infrared data association (IrDA)) or the second network **199** (e.g., a long-range communication network, such as a cellular network, the Internet, or a computer network (e.g., LAN or wide area network (WAN))). These various types of communication modules may be implemented as a single component (e.g., a single chip), or may be implemented as multi components (e.g., multi chips) separate from each other. The wireless communication module **192** may identify and authenticate the electronic device **101** in a communication network, such as the first network **198** or the second network **199**, using subscriber information (e.g., international mobile subscriber identity (IMSI)) stored in the subscriber identification module **196**.

The antenna module **197** may transmit or receive a signal or power to or from the outside (e.g., the external electronic device) of the electronic device **101**. According to an embodiment, the antenna module **197** may include an antenna including a radiating element composed of a conductive material or a conductive pattern formed in or on a substrate (e.g., PCB). According to an embodiment, the antenna module **197** may include a plurality of antennas. In such a case, at least one antenna appropriate for a communication scheme used in the communication network, such as the first network **198** or the second network **199**, may be selected, for example, by the communication module **190** (e.g., the wireless communication module **192**) from the plurality of antennas. The signal or the power may then be transmitted or received between the communication module **190** and the external electronic device via the selected at least one antenna. According to an embodiment, another component (e.g., a radio frequency integrated circuit (RFIC)) other than the radiating element may be additionally formed as part of the antenna module **197**.

At least some of the above-described components may be coupled mutually and communicate signals (e.g., commands or data) therebetween via an inter-peripheral communication scheme (e.g., a bus, general purpose input and output (GPIO), serial peripheral interface (SPI), or mobile industry processor interface (MIPI)).

According to an embodiment, commands or data may be transmitted or received between the electronic device **101** and the external electronic device **104** via the server **108** coupled with the second network **199**. Each of the electronic devices **102** and **104** may be a device of a same type as, or a different type, from the electronic device **101**. According to an embodiment, all or some of operations to be executed at the electronic device **101** may be executed at one or more of the external electronic devices **102**, **104**, or **108**. For example, if the electronic device **101** should perform a function or a service automatically, or in response to a request from a user or another device, the electronic device **101**, instead of, or in addition to, executing the function or the service, may request the one or more external electronic devices to perform at least part of the function or the service. The one or more external electronic devices receiving the

request may perform the at least part of the function or the service requested, or an additional function or an additional service related to the request, and transfer an outcome of the performing to the electronic device 101. The electronic device 101 may provide the outcome, with or without further processing of the outcome, as at least part of a reply to the request. To that end, a cloud computing, distributed computing, or client-server computing technology may be used, for example.

FIG. 2 is a block diagram 200 illustrating the program 140 according to various embodiments. According to an embodiment, the program 140 may include an operating system (OS) 142 to control one or more resources of the electronic device 101, middleware 144, or an application 146 executable in the OS 142. The OS 142 may include, for example, Android™, iOS™, Windows™, Symbian™, Tizen™, or Bada™. At least part of the program 140, for example, may be pre-loaded on the electronic device 101 during manufacture, or may be downloaded from or updated by an external electronic device (e.g., the electronic device 102 or 104, or the server 108) during use by a user.

The OS 142 may control management (e.g., allocating or deallocation) of one or more system resources (e.g., process, memory, or power source) of the electronic device 101. The OS 142, additionally or alternatively, may include one or more driver programs to drive other hardware devices of the electronic device 101, for example, the input device 150, the sound output device 155, the display device 160, the audio module 170, the sensor module 176, the interface 177, the haptic module 179, the camera module 180, the power management module 188, the battery 189, the communication module 190, the subscriber identification module 196, or the antenna module 197.

The middleware 144 may provide various functions to the application 146 such that a function or information provided from one or more resources of the electronic device 101 may be used by the application 146. The middleware 144 may include, for example, an application manager 201, a window manager 203, a multimedia manager 205, a resource manager 207, a power manager 209, a database manager 211, a package manager 213, a connectivity manager 215, a notification manager 217, a location manager 219, a graphic manager 221, a security manager 223, a telephony manager 225, or a voice recognition manager 227.

The application manager 201, for example, may manage the life cycle of the application 146. The window manager 203, for example, may manage one or more graphical user interface (GUI) resources that are used on a screen. The multimedia manager 205, for example, may identify one or more formats to be used to play media files, and may encode or decode a corresponding one of the media files using a codec appropriate for a corresponding format selected from the one or more formats. The resource manager 207, for example, may manage the source code of the application 146 or a memory space of the memory 130. The power manager 209, for example, may manage the capacity, temperature, or power of the battery 189, and determine or provide related information to be used for the operation of the electronic device 101 based at least in part on corresponding information of the capacity, temperature, or power of the battery 189. According to an embodiment, the power manager 209 may interwork with a basic input/output system (BIOS) (not shown) of the electronic device 101.

The database manager 211, for example, may generate, search, or change a database to be used by the application 146. The package manager 213, for example, may manage installation or update of an application that is distributed in

the form of a package file. The connectivity manager 215, for example, may manage a wireless connection or a direct connection between the electronic device 101 and the external electronic device. The notification manager 217, for example, may provide a function to notify a user of an occurrence of a specified event (e.g., an incoming call, message, or alert). The location manager 219, for example, may manage locational information on the electronic device 101. The graphic manager 221, for example, may manage one or more graphic effects to be offered to a user or a user interface related to the one or more graphic effects.

The security manager 223, for example, may provide system security or user authentication. The telephony manager 225, for example, may manage a voice call function or a video call function provided by the electronic device 101. The voice recognition manager 227, for example, may transmit a user's voice data to the server 108, and receive, from the server 108, a command corresponding to a function to be executed on the electronic device 101 based at least in part on the voice data, or text data converted based at least in part on the voice data. According to an embodiment, the middleware 244 may dynamically delete some existing components or add new components. According to an embodiment, at least part of the middleware 144 may be included as part of the OS 142 or may be implemented as another software separate from the OS 142.

The application 146 may include, for example, a home 251, dialer 253, short message service (SMS)/multimedia messaging service (MMS) 255, instant message (IM) 257, browser 259, camera 261, alarm 263, contact 265, voice recognition 267, email 269, calendar 271, media player 273, album 275, watch 277, health 279 (e.g., for measuring the degree of workout or biometric information, such as blood sugar), or environmental information 281 (e.g., for measuring air pressure, humidity, or temperature information) application. According to an embodiment, the application 146 may further include an information exchanging application (not shown) that is capable of supporting information exchange between the electronic device 101 and the external electronic device. The information exchange application, for example, may include a notification relay application adapted to transfer designated information (e.g., a call, message, or alert) to the external electronic device or a device management application adapted to manage the external electronic device. The notification relay application may transfer notification information corresponding to an occurrence of a specified event (e.g., receipt of an email) at another application (e.g., the email application 269) of the electronic device 101 to the external electronic device. Additionally or alternatively, the notification relay application may receive notification information from the external electronic device and provide the notification information to a user of the electronic device 101.

The device management application may control the power (e.g., turn-on or turn-off) or the function (e.g., adjustment of brightness, resolution, or focus) of the external electronic device or some component thereof (e.g., a display device or a camera module of the external electronic device). The device management application, additionally or alternatively, may support installation, delete, or update of an application running on the external electronic device.

FIG. 3 is a diagram illustrating a user input support system 300 according to various embodiments of the disclosure.

The user input support system 300 according to various embodiments of the disclosure may include a first electronic device 400 and a second electronic device 500. The user

input support system 300 may enable user input that can be performed on the second electronic device 500 to be performed more simply by using the first electronic device 400.

According to various embodiments of the disclosure, the first electronic device 400 and the second electronic device 500 may be connected to each other through various wireless or wired communication methods including Wi-Fi, Wi-Fi Direct, or Bluetooth.

According to various embodiments of the disclosure, the second electronic device 500 may include a display capable of receiving a user input (e.g., display device 160 in FIG. 1). The second electronic device 500 may receive a user input on the display and execute a function corresponding to the user input. For example, the second electronic device 500 may execute a drawing application, and the user may perform drawing on the display. The second electronic device 500 may display a drawing result according to a user input.

According to various embodiments of the disclosure, the second electronic device 500 may display a first region (e.g., first region 810 in FIG. 8) for receiving a user input and displaying a result corresponding to the user input, and a second region (e.g., second region 820 in FIG. 8) for displaying one or more objects for controlling various functions of the second electronic device 500. The user may perform an input on the first region 810 and may perform an input on the second region 820 to control a function related to the input performed on the first region 810. For example, when the second electronic device 500 is running a drawing application, the user may perform a drawing input on the first region 810 and may perform an interaction with objects on the second region 820 to control various functions (e.g., various functions including changing colors, undoing, aligning, and changing character attributes) for controlling the drawing input.

According to various embodiments of the disclosure, while performing a user input on the first region 810, the user may select an object included in the second region 820 to change the function related to the user input. The action described above may cause a phenomenon in which the user's gaze is shifted from the first region 810 where user input is performed to the second region 820 including at least one object for executing a desired function. The action described above may cause a problem of interrupting task performance of the user and reducing the efficiency of the user input.

The user input support system 300 according to various embodiments of the disclosure may support the operation of controlling functions related to user input by using the first electronic device 400 connected to the second electronic device 500 so as to reduce the repetitive input process for controlling functions desired by the user and to keep the user's gaze on the first region 810. The first electronic device 400 may receive user input performed on the first electronic device 400 and may control the second electronic device 500 to control a function corresponding to the user input (e.g.,

executing a function or changing a function). Hereinafter, an operation of controlling functions related to user input using the first electronic device 400 in order to keep the user's gaze on the first region 810 will be given in detail.

FIG. 4 is a block diagram of the first electronic device according to various embodiments of the disclosure.

With reference to FIG. 4, the first electronic device (e.g., first electronic device 400 in FIG. 3) according to various embodiments of the disclosure may include a communication module 410 (e.g., communication module 190 in FIG. 1), a display 420 (e.g., display device 160 in FIG. 1), a memory 430 (e.g., memory 130 in FIG. 1), and a processor 440 (e.g., processor 120 in FIG. 1).

According to various embodiments of the disclosure, data may be transmitted/received to/from the second electronic device (e.g., second electronic device 500 in FIG. 3) through the communication module 410. The communication module 410 may receive state information of the second electronic device 500 from the second electronic device 500 at every preset period. The state information of the second electronic device 500 may include information indicating an application running on the second electronic device 500 or information indicating a function executed by the application. When an application is executed or when the function executed by a running application is changed, the second electronic device 500 may transmit state information of the second electronic device 500 to the first electronic device 400. The communication module 410 may receive state information of the second electronic device 500 and forward the state information of the second electronic device 500 to the processor 440.

According to various embodiments of the disclosure, the display 420 may receive a user input entered on the display 420. The display 420 may display an object indicating a function executed on the second electronic device 500.

According to various embodiments of the disclosure, the memory 430 may store a command for the second electronic device 500 to execute a function. The function of the second electronic device 500 may include a function related to a user input. For example, the functions related to user input may include functions related to changing colors, undoing, aligning, and changing character attributes in a drawing application. The memory 430 may store state information of the second electronic device 500 and commands for executing functions of the second electronic device 500 corresponding to user input received by the first electronic device 400.

According to various embodiments of the disclosure, the memory 430 may store commands in consideration of state information of the second electronic device 500, so that a different command may be executed even if the same user input is entered. For example, with reference to Table 1 below, the first user input and the second user input received by the first electronic device 400 may correspond to different commands according to state information of the second electronic device 400 even if they are the same user input.

TABLE 1

User input	State information of second electronic device 500	Command
Simultaneous input of two fingers on display 420	Performing drawing input on drawing application Selecting text object on drawing application	Change drawing attribute (e.g., color) Change character attribute (e.g., character shape)
Input to move a finger	Performing drawing input on	Undo previously performed

TABLE 1-continued

User input	State information of second electronic device 500	Command
in first direction on display 420	drawing application	operation (e.g., drawing a line)
	Selecting object on drawing application	Align objects
Input to rotate first electronic device 400 in second direction	Performing drawing input on drawing application	Continuously change the color of the input drawing
Close gesture input on display 420	Performing drawing input on drawing application	Remove all user inputs entered in drawing region

According to various embodiments of the disclosure, the processor 440 may control the communication module 410 to receive state information of the second electronic device 500.

According to various embodiments of the disclosure, the processor 440 may receive a first user input for controlling the second electronic device 500. The first user input may be detected by various components of the first electronic device 400. For example, the display 420 of the first electronic device 400 may detect a first user input entered on the display 420. As another example, among various sensors included in the first electronic device 400 (e.g., sensor module 176 in FIG. 1), the gyro sensor or the acceleration sensor may detect a first user input causing movement of the first electronic device 400.

According to various embodiments of the disclosure, the processor 440 may determine a first command corresponding to state information of the second electronic device 500 and the first user input among various commands stored in the memory 430. The first command may indicate a command for controlling an application running on the second electronic device 500 or a function that can be used in the running application. The processor 440 may control the second electronic device 500 to execute a function corresponding to the determined first command.

For example, according to confirming that the first user input is an input of simultaneously touching two fingers on the display 420 and confirming that the second electronic device 500 is executing a drawing application and performs a function of receiving a drawing input based on the state information of the second electronic device 500, the processor 440 may determine a first command for changing the color of the line being drawn from a first color (e.g., black) to a second color (e.g., red). The processor 440 may control the second electronic device 500 to change the color of the line being drawn on the second electronic device 500 from the first color to the second color.

According to various embodiments of the disclosure, the first electronic device 400 may control the second electronic device 500 in consideration of state information of the second electronic device 500. When the first electronic device 400 receives the same user input, functions executed on the second electronic device 500 may be different according to the state information of the second electronic device 500. Through this, the first electronic device 400 may select a function to be executed on the second electronic device 500 even if it does not receive a user input for selecting a function to be executed on the second electronic device 500. By receiving state information of the second electronic device 500, the first electronic device 400 may prevent a phenomenon in which the user's gaze is shifted from the first region 810 where the user input is entered to the second

15 region 820 including at least one object for executing a desired function, increasing the work efficiency of the user.

According to various embodiments of the disclosure, the first user input may indicate a user input for an arbitrary zone on the display 420. The arbitrary zone on the display 420 may indicate a region that is not specified in advance. According to various embodiments of the disclosure, the first electronic device 400 may receive a first user input for an unspecified arbitrary zone on the display 420. As the user can perform an input for an unspecified arbitrary zone on the display 420, the phenomenon in which the user's gaze is shifted from the first region 810 where the user input is entered to the second region 820 including at least one object for executing a desired function can be prevented, which can increase the work efficiency of the user.

30 According to various embodiments of the disclosure, when a second user input different from the first user input is received, the processor 440 may determine a second command corresponding to state information of the second electronic device 500 and the second user input. The processor 440 may control the second electronic device 500 to execute a function corresponding to the determined second command.

For example, according to confirming that the first user input is an input of simultaneously touching two fingers on the display 420 and confirming that the second electronic device 500 is executing a drawing application and performs a function of receiving a drawing input based on the state information of the second electronic device 500, the processor 440 may determine a first command for changing the color of the line being drawn from a first color (e.g., black) to a second color (e.g., red). The processor 440 may control the second electronic device 500 to change the color of the line being drawn on the second electronic device 500 from the first color to the second color. Upon receiving a second user input, the processor 440 may confirm that the second user input is an input for moving a finger in a first direction on the display 420 and may undo the previously performed operation (e.g., drawing a line with a second color).

According to various embodiments of the disclosure, the processor 440 may continuously receive state information of the second electronic device 500. In response to a change in the state information of the second electronic device 500, the processor 440 may select a command corresponding to a function to be executed on the second electronic device 500 according to the changed state information and user input.

According to various embodiments of the disclosure, the processor 440 may receive second state information different from the first state information of the second electronic device 500 and a second user input identical to the first user input. The processor 440 may determine a second command corresponding to the second state information and the second user input, and may control the second electronic device

500 to execute a function corresponding to the determined second command. The processor **440** may consider state information of the second electronic device **500**, and thus may execute different commands even when the same user input is received. With reference to Table 1 described above, a first user input and a second user input received by the first electronic device **400** may be mapped to different commands according to state information of the second electronic device **400** even if they are the same user input.

According to various embodiments of the disclosure, the processor **440** may control various electronic components of the first electronic device **400** to output a feedback indicating the function corresponding to the determined first command or the determined second command. The feedback indicating a function may be output using the display, vibrations or sounds. For example, the processor **440** may control the sound output device (e.g., sound output device **155** in FIG. 1) to output a sound indicating the function corresponding to the determined command. As another example, the processor **440** may control the haptic module **179** to output a vibration indicating the function corresponding to the determined command.

FIG. 5 is a block diagram of the second electronic device according to various embodiments of the disclosure.

With reference to FIG. 5, the second electronic device (e.g., second electronic device **500** in FIG. 3) according to various embodiments of the disclosure may include a communication module **510** (e.g., communication module **190** in FIG. 1), a display **520** (e.g., display device **160** in FIG. 1), a memory **530** (e.g., memory **130** in FIG. 1), and a processor **540** (e.g., processor **120** in FIG. 1).

According to various embodiments of the disclosure, the communication module **510** may transmit and receive data to and from the first electronic device (e.g., first electronic device **400** in FIG. 3). The communication module **510** may transmit state information of the second electronic device **500** to the first electronic device **400**. When an application is executed or when a function performed by the running application is changed, the second electronic device **500** may transmit state information of the second electronic device **500** to the first electronic device **400**.

According to various embodiments of the disclosure, the display **520** may receive a user input and output a result corresponding to the user input. For example, when a drawing application is running on the second electronic device **500**, the display **520** may receive a user input for drawing and display a drawing corresponding to the user input.

According to various embodiments of the disclosure, the display **520** may display a first region (e.g., first region **810** in FIG. 8) for receiving a user input and displaying a result corresponding to the user input, and a second region (e.g., second region **820** in FIG. 8) for displaying one or more objects for controlling various functions of the second electronic device **500**. The user may perform an input on the first region **810** and may perform an input on the second region **820** to control a function related to the input performed on the first region **810**. For example, when the second electronic device **500** is running a drawing application, the user may perform a drawing input on the first region **810** and may perform an interaction with objects on the second region **820** to control various functions (e.g., various functions including changing colors, undoing, aligning, and changing character attributes) for controlling the drawing input.

According to various embodiments of the disclosure, the memory **530** may store various data for receiving user input

and processing the user input. For example, the memory **530** may store various applications that process user input and data related to the applications.

According to various embodiments of the disclosure, the processor **540** may receive a user input and output a result corresponding to the user input based on the user input. For example, when the second electronic device **500** is executing a drawing application, the processor **540** may control the display **520** to receive a drawing input performed on the first region **810** and output a result (drawing) corresponding to the drawing input. As another example, when the second electronic device **500** is executing a drawing application, the processor **540** may receive a user input on the second region **820** for selecting objects indicating various functions for controlling the drawing input and execute a function corresponding to a selected object.

According to various embodiments of the disclosure, the processor **540** may check state information of the second electronic device **500** and may control the communication module **510** to transmit the state information of the second electronic device **500** to the first electronic device **400**.

According to various embodiments of the disclosure, the processor **540** may receive a command transmitted from the first electronic device **400** and execute a function corresponding to the command. As described above in FIG. 4, the first electronic device **400** may determine a command corresponding to state information of the second electronic device **500** and a user input received by the first electronic device **400**, and transmit the determined command information to the second electronic device **500**. The processor **540** may receive the command transmitted by the first electronic device **400** and execute a function corresponding to the command.

According to various embodiments of the disclosure, the processor **540** may detect that the state of the second electronic device **500** is changed. For example, the processor **540** may detect that an application running on the second electronic device **500** is changed. As another example, the processor **540** may detect that a function operating in an application running on the second electronic device **500** is changed. The processor **540** may detect that the state of the second electronic device **500** is changed, and control the communication module **510** to transmit the changed state information of the second electronic device **500** to the first electronic device **400**. The processor **540** may receive a determined command from the first electronic device **400** and execute a function corresponding to the determined command.

According to various embodiments of the disclosure, the processor **540** may output a feedback indicating a function corresponding to the first command. For example, the processor **540** may control the display **520** to display a feedback indicating a function corresponding to the first command. As another example, the processor **540** may control the speaker (e.g., speaker **155** in FIG. 1) or the haptic module (e.g., haptic module **179** in FIG. 1) to output a feedback indicating a function corresponding to the first command. By checking the feedback output in various ways, the user can identify whether the function corresponding to the user input matches the intended function. Through this, it is possible to prevent a phenomenon in which the user's gaze is shifted from the first region **810** where the user input is performed to the second region **820** including at least one object for executing a desired function, which can increase the work efficiency of the user.

FIG. 6 is an operation flow diagram illustrating a first embodiment of an operation method **600** between the first

15

electronic device (e.g., first electronic device **400** in FIG. **3**) and the second electronic device (e.g., second electronic device **500** in FIG. **3**) according to various embodiments of the disclosure.

According to various embodiments of the disclosure, at operation **601**, the first electronic device **400** and the second electronic device **500** may perform pairing to transmit and receive data to and from each other. The first electronic device **400** and the second electronic device **500** may be paired through various wireless or wired communication means including Wi-Fi, Wi-Fi Direct, and Bluetooth.

According to various embodiments of the disclosure, at operation **603**, the second electronic device **500** may transmit a signal for requesting execution of a user input mode using the first electronic device **400**. For example, the second electronic device **500** may determine whether to execute the user input mode using the first electronic device **400** according to a user input performed by the user on the display or a user input utilizing a voice command agent. The second electronic device **500** may determine to execute the user input mode using the first electronic device **400**, and transmit an execution request signal for the user input mode using the first electronic device **400** to the first electronic device **500**.

According to various embodiments of the disclosure, after transmitting the signal requesting execution of the user input mode using the first electronic device **500**, the second electronic device **500** may perform a series of preparation operations for the user input mode using the first electronic device **500**. In response to receiving the request signal for executing the user input mode using the first electronic device **500**, the first electronic device **400** may perform a series of preparation operations for the user input mode using the first electronic device **500**.

According to various embodiments of the disclosure, although it is described at operation **603** that the second electronic device **500** transmits a signal for requesting execution of a user input mode using the first electronic device **400**, the first electronic device **400** may transmit a signal for requesting execution of a user input mode using the first electronic device **400** to the second electronic device **500**.

According to various embodiments of the disclosure, at operation **605**, the second electronic device **500** may transmit state information of the second electronic device **500** to the first electronic device **400**. The state information of the second electronic device **500** may include information indicating an application running on the second electronic device **500** or information indicating a function executed by the application. When an application is executed or when a function performed by a running application is changed, the second electronic device **500** may transmit state information of the second electronic device **500** to the first electronic device **400**.

According to various embodiments of the disclosure, at operation **607**, the first electronic device **400** may receive a user input. The user input may be a user input for controlling an application running on the second electronic device **500** or a function that can be used in the running application (e.g., execution of a function or change of a function).

According to various embodiments of the disclosure, the user input may indicate a user input for an arbitrary zone on the display **420**. The arbitrary zone on the display **420** may indicate a region that is not specified in advance. According to various embodiments of the disclosure, the first electronic device **400** may receive a user input for an unspecified arbitrary zone on the display **420**. As the user can perform

16

an input for an unspecified arbitrary zone on the display **420**, the phenomenon in which the user's gaze is shifted from the first region where the user input is entered (e.g., first region **810** in FIG. **8**) to the second region **820** including at least one object for executing a desired function can be prevented, which can increase the work efficiency of the user.

According to various embodiments of the disclosure, the user input may be sensed by various components of the first electronic device **400**. For example, the display (e.g., display **420** in FIG. **4**) of the first electronic device **400** may detect a user input entered on the display **420**. As another example, among various sensors included in the first electronic device **400** (e.g., sensor module **176** in FIG. **1**), the proximity sensor, the gyro sensor, or the acceleration sensor may sense a user input for changing the posture of the first electronic device **400**.

According to various embodiments of the disclosure, at operation **609**, the first electronic device **400** may determine a command corresponding to the state information of the second electronic device and the user input. The command may indicate a command for controlling an application running on the second electronic device **500** or a function that can be used in the running application.

According to various embodiments of the disclosure, at operation **611**, the first electronic device **400** may control the second electronic device **500** to execute a function corresponding to the determined command.

According to various embodiments of the disclosure, at operation **613**, the second electronic device **500** may execute a function corresponding to the command determined by the first electronic device **400**.

FIGS. **7A** and **7B** are a diagram illustrating a second embodiment related to an operation method **700** between the first electronic device (e.g., first electronic device **400** in FIG. **3**) and the second electronic device (e.g., second electronic device **500** in FIG. **3**) according to various embodiments of the disclosure.

According to various embodiments of the disclosure, at operation **701**, the first electronic device **400** and the second electronic device **500** may perform pairing to transmit and receive data to and from each other. The first electronic device **400** and the second electronic device **500** may be paired through various wireless or wired communication means including Wi-Fi, Wi-Fi Direct, and Bluetooth.

According to various embodiments of the disclosure, at operation **703**, the second electronic device **500** may transmit a signal for requesting execution of a user input mode using the first electronic device **400**. For example, the second electronic device **500** may determine whether to execute the user input mode using the first electronic device **400** according to a user input performed by the user on the display or a user input utilizing a voice command agent. The second electronic device **500** may determine to execute the user input mode using the first electronic device **400**, and transmit an execution request signal for the user input mode using the first electronic device **400** to the first electronic device **500**.

According to various embodiments of the disclosure, after transmitting the signal requesting execution of the user input mode using the first electronic device **500**, the second electronic device **500** may perform a series of preparation operations for the user input mode using the first electronic device **500**. In response to receiving the request signal for executing the user input mode using the first electronic device **500**, the first electronic device **400** may perform a series of preparation operations for the user input mode using the first electronic device **500**.

According to various embodiments of the disclosure, although it is described at operation 703 that the second electronic device 500 transmits a signal for requesting execution of a user input mode using the first electronic device 400, the first electronic device 400 may transmit a signal for requesting execution of a user input mode using the first electronic device 400 to the second electronic device 500.

According to various embodiments of the disclosure, at operation 705, the second electronic device 500 may transmit first state information of the second electronic device 500 to the first electronic device 400. The first state information of the second electronic device 500 may include information indicating an application running on the second electronic device 500 or information indicating a function executed by the application. When an application is executed or when a function performed by a running application is changed, the second electronic device 500 may transmit second state information being the changed state information of the second electronic device 500 to the first electronic device 400.

According to various embodiments of the disclosure, at operation 707, the first electronic device 400 may receive a first user input. The first user input may be a user input for controlling an application running on the second electronic device 500 or a function that can be used in the running application (e.g., execution of a function or change of a function).

According to various embodiments of the disclosure, the first user input may indicate a user input for an arbitrary zone on the display 420. The arbitrary zone on the display 420 may indicate a region that is not specified in advance. According to various embodiments of the disclosure, the first electronic device 400 may receive a first user input for an unspecified arbitrary zone on the display 420. As the user can perform an input for an unspecified arbitrary zone on the display 420, the phenomenon in which the user's gaze is shifted from the first region where the user input is entered (e.g., first region 810 in FIG. 8) to the second region including at least one object for executing a desired function (e.g., second region 820 in FIG. 8) can be prevented, which can increase the work efficiency of the user.

According to various embodiments of the disclosure, the first user input may be sensed by various components of the first electronic device 400. For example, the display (e.g., display 420 in FIG. 4) of the first electronic device 400 may detect a first user input entered on the display 420. As another example, among various sensors included in the first electronic device 400 (e.g., sensor module 176 in FIG. 1), the proximity sensor, the gyro sensor, or the acceleration sensor may sense a user input causing movement of the first electronic device 400.

According to various embodiments of the disclosure, at operation 709, the first electronic device 400 may determine a first command corresponding to the state information of the second electronic device and the user input. The first command may indicate a command for controlling an application running on the second electronic device 500 or a function that can be used in the running application.

According to various embodiments of the disclosure, at operation 711, the first electronic device 400 may control the second electronic device 500 to execute a function corresponding to the determined first command.

According to various embodiments of the disclosure, at operation 713, the second electronic device 500 may execute a function corresponding to the first command determined by the first electronic device 400.

According to various embodiments of the disclosure, at operation 715, the second electronic device 500 may detect a change in the state of the second electronic device 500. The state change of the second electronic device 500 may indicate a state in which an application running on the second electronic device 500 is terminated and another application is executed, or a state in which a function being executed in a running application is terminated and another function is executed.

According to various embodiments of the disclosure, at operation 717, the second electronic device 500 may transmit second state information of the second electronic device 500 to the first electronic device 400. The second state information of the second electronic device 500 may include information indicating an application running on the second electronic device 500 or information indicating a function executed by the application. The second state information may be state information different from the first state information.

According to various embodiments of the disclosure, at operation 719, the first electronic device 400 may receive a second user input. The second user input may be a user input for controlling an application running on the second electronic device 500 or a function that can be used in the running application (e.g., execution of a function or change of a function).

According to various embodiments of the disclosure, the second user input may be sensed by various components of the first electronic device 400. For example, the display (e.g., display 420 in FIG. 4) of the first electronic device 400 may detect a second user input entered on the display 420. As another example, among various sensors included in the first electronic device 400 (e.g., sensor module 176 in FIG. 1), the proximity sensor, the gyro sensor, or the acceleration sensor may sense a second user input for changing the posture of the first electronic device 400.

According to various embodiments of the disclosure, at operation 721, the first electronic device 400 may determine a second command corresponding to the second state information and the second user input. The second command may indicate a command for controlling an application running on the second electronic device 500 or a function that can be used in the running application.

According to various embodiments of the disclosure, the first electronic device 400 may consider state information of the second electronic device 500, and thus may execute different commands even when the same user input is received. The first user input and the second user input received by the first electronic device 400 may be mapped to different commands according to state information of the second electronic device 400 even if they are the same user input.

With reference to Table 1, when the first state information includes a state in which the user performs a drawing input in a drawing application running on the second electronic device 500 and the second state information is a state in which the user selects an object in the drawing application running on the second electronic device 500, although identical user inputs (e.g., first user input and second user input for moving a finger in a first direction on the display (e.g., display 420 in FIG. 4)) are received, commands to be executed may be different. The command corresponding to the first state information and the first user input may be a command for undoing a previously performed operation, and the command corresponding to the second state information and the second user input may be a command for aligning objects.

According to various embodiments of the disclosure, the first electronic device **400** may control the second electronic device **500** in consideration of state information of the second electronic device **500**. When the first electronic device **400** receives the same user input, functions executed on the second electronic device **500** may be different according to the state information of the second electronic device **500**. Through this, the first electronic device **400** may select a function to be executed on the second electronic device **500** even if it does not receive a user input for selecting a function to be executed on the second electronic device **500**. By receiving state information of the second electronic device **500**, the first electronic device **400** may prevent a phenomenon in which the user's gaze is shifted from the first region **810** where the user input is entered to the second region **820** including at least one object for executing a desired function, increasing the work efficiency of the user.

According to various embodiments of the disclosure, at operation **723**, the first electronic device **400** may control the second electronic device **500** to execute a function corresponding to the determined second command.

According to various embodiments of the disclosure, at operation **725**, the second electronic device **500** may execute a function corresponding to the second command determined by the first electronic device **400**.

FIGS. **8** to **20** are diagrams illustrating embodiments of the first electronic device and the second electronic device according to various embodiments of the disclosure.

FIG. **8** shows screens displayed by the first electronic device (e.g., first electronic device **400** in FIG. **3**) and the second electronic device (e.g., second electronic device **500** in FIG. **3**) according to various embodiments of the disclosure.

With reference to FIG. **8**, the second electronic device **500** may display a first region **810** for receiving a user input and displaying a result corresponding to the user input, and a second region **820** for displaying one or more objects for controlling various functions of the second electronic device **500**. The user may perform an input on the first region **810** and may perform an input on the second region **820** to control various functions of the second electronic device **500**. For example, when the second electronic device **500** is running a drawing application, the user may perform a drawing input on the first region **810** and may perform an interaction with objects on the second region **820** to control various functions (e.g., various functions including changing colors, undoing, aligning, and changing character attributes) for controlling the drawing input.

According to various embodiments of the disclosure, while performing a user input on the first region **810**, the user may select an object included in the second region **820** to change the function related to the user input. The action described above may cause a phenomenon in which the user's gaze is shifted from the first region **810** where user input is performed to the second region **820** including at least one object for executing a desired function. The action described above may cause a problem of interrupting task performance of the user and reducing the efficiency of the user input.

According to various embodiments of the disclosure, the first electronic device **400** may display a third region **830** for receiving a user input and displaying a result corresponding to the user input, and a fourth region **840** for displaying one or more objects for controlling various functions of the second electronic device **500**. The fourth region **840** may be omitted according to the user's intention.

According to various embodiments of the disclosure, the first electronic device **400** may receive a user input for an arbitrary zone on the third region **830**, and may determine a command for controlling the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input received from the first electronic device **400**. The first electronic device **400** may transmit the determined command to the second electronic device **500**. The arbitrary zone on the display **420** may indicate a region that is not specified in advance. According to various embodiments of the disclosure, the first electronic device **400** may receive a user input for an unspecified arbitrary zone on the display **420**. As the user can perform an input for an unspecified arbitrary zone on the display **420**, the phenomenon in which the user's gaze is shifted from the first region **810** where the user input is entered to the second region **820** including at least one object for executing a desired function can be prevented, which can increase the work efficiency of the user.

FIGS. **9A** to **9C** are diagrams illustrating an embodiment of an input mode using the first electronic device **400**.

With reference to FIG. **9A**, while executing a drawing application, the second electronic device **500** may receive a user input for performing drawing and display a result **910** corresponding to the user input.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing drawing input mode).

With reference to FIG. **9B**, the first electronic device **400** may receive a user input **920** on an arbitrary zone of the third region **830** (e.g., two-finger touch on an arbitrary zone of the third region **830**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **920**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of drawing a line with a second color changed from a first color. With reference to FIG. **9C**, it can be seen that the result **930** of the drawing performed by the user on the first region **810** is a change from the first color to the second color.

According to various embodiments of the disclosure, the second electronic device **500** may output an indicator indicating the function corresponding to a command. With reference to FIG. **9A**, an indicator **915** indicating a first color may be displayed. With reference to FIGS. **9B** and **9C**, the second electronic device **500** may display an indicator **925** indicating the function corresponding to a command (change to a second color).

FIGS. **10A** and **10B** are diagrams illustrating another embodiment of an input mode using the first electronic device **400**.

FIGS. **10A** and **10B** are depicted on the assumption that the action shown in FIG. **9C** has been performed.

With reference to FIG. **10A**, the first electronic device **400** may receive a user input **1010** (e.g., swipe input of moving a finger in a first direction) on an arbitrary zone of the third region **830**. The first electronic device **400** may determine a command for a function to be executed on the second

electronic device **500** based on the state information of the second electronic device **500** (e.g., performing drawing input mode) and the user input **1010**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. With reference to FIG. **9**, the function corresponding to the determined command may be a function of undoing a previously executed operation. With reference to FIG. **10B**, it can be seen that the result **930** of the drawing performed by the user on the first region **810** is undone.

FIGS. **11A** to **11C** are diagrams illustrating another embodiment of an input mode using the first electronic device **400**.

With reference to FIG. **11A**, while executing a drawing application, the second electronic device **500** may receive a user input for performing drawing and display a result **1110** corresponding to the user input.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing drawing input mode).

With reference to FIG. **11B**, the first electronic device **400** may receive a user input **1120** for rotating the first electronic device **400**. The first electronic device **400** may detect whether the first electronic device **400** is rotated and the degree of rotation of the first electronic device **400** by using the gyro sensor of the first electronic device **400**.

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** and the user input **1120**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of drawing a line with a second color changed from a first color. With reference to FIG. **11C**, it can be seen that the result **1130** of the drawing performed by the user on the first region **810** is a change from the first color to the second color.

According to various embodiments of the disclosure, the first electronic device **400** may determine the color to be changed according to the degree of rotation of the first electronic device **400**. For example, the first electronic device **400** may increase the saturation of the previous color in proportion to the degree of rotation.

FIGS. **12A** to **12C** are diagrams illustrating another embodiment of an input mode using the first electronic device **400**.

With reference to FIG. **12A**, while executing a drawing application, the second electronic device **500** may receive a user input for performing drawing and display a result **1210** corresponding to the user input.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing drawing input mode).

With reference to FIG. **12B**, the first electronic device **400** may receive a user's gesture input **1220** on the first electronic device **400**. The first electronic device **400** may receive the user's gesture input **1220** by using the proximity sensor of the first electronic device **400**.

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a

function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** and the user input **1220**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of removing the result corresponding to the user input. With reference to FIG. **12C**, it can be seen that the result **1210** corresponding to the user input has been removed.

FIGS. **13A** to **13C** are diagrams illustrating another embodiment of an input mode using the first electronic device **400**.

With reference to FIG. **13A**, while executing a drawing application, the second electronic device **500** may receive a user input for selecting one of a plurality of objects **1310** and **1320** displayed on the first region **810**.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing object selection mode).

With reference to FIG. **13B**, the first electronic device **400** may receive a user input **1330** on an arbitrary zone of the third region **830** (e.g., two-finger touch on an arbitrary zone of the third region **830**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1330**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of changing the shape of characters in the currently selected object **1310**. With reference to FIG. **13C**, it can be seen that the shape of the characters in the object **1310** displayed on the first region **810** has been changed.

FIGS. **14A** to **14C** are diagrams illustrating another embodiment of an input mode using the first electronic device **400**.

With reference to FIG. **14A**, while executing a drawing application, the second electronic device **500** may receive a user input for selecting two or more objects **1410**, **1420** and **1430** from among a plurality of objects **1410**, **1420** and **1430** displayed on the first region **810**.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing object selection mode).

With reference to FIG. **14B**, the first electronic device **400** may receive a user input **1440** on an arbitrary zone of the third region **830** (e.g., swipe input by moving a finger in a first direction).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1440**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined

command may be a function of aligning the currently selected objects **1410**, **1420** and **1430**. With reference to FIG. **14C**, it can be seen that the objects **1410**, **1420** and **1430** displayed on the first region **810** are aligned.

FIGS. **15A** to **15D** are diagrams illustrating another embodiment of an input mode using the first electronic device **400** according to various embodiments of the disclosure.

With reference to FIG. **15A**, while executing a drawing application, the second electronic device **500** may receive a user input for performing drawing and display a result **1510** corresponding to the user input.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing drawing input mode) received from the second electronic device **500**.

With reference to FIG. **15B**, the first electronic device **400** may receive a user input **1520** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., two-finger touch on an arbitrary zone of the third region **830**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1520**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of drawing a line with a second color changed from a first color. With reference to FIG. **15C**, it can be seen that the result **1530** of the drawing performed by the user on the first region **810** is a change from the first color to the second color.

According to various embodiments of the disclosure, the first electronic device **400** may control the second electronic device **500** to change the drawing result from the first color to the second color while the user input **1520** is maintained. When the user input **1520** is ended, the drawing may be changed from the second color to the first color. With reference to FIG. **15D**, it can be seen that the result **1540** of the drawing performed by the user on the first region **810** is a change from the second color to the first color after the user input **1520** is ended.

According to various embodiments of the disclosure, the first electronic device **400** may receive a user input on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., one-finger touch on an arbitrary zone of the third region **830**). The first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** and the user input, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of changing from a ballpoint pen tool to a brush tool.

According to various embodiments of the disclosure, the first electronic device **400** may receive a user input on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., three-finger touch on an arbitrary zone of the third region **830**). The first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the

second electronic device **500** and the user input, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be to execute a cutting function.

FIGS. **16A** to **16D** are diagrams illustrating another embodiment of an input mode using the first electronic device **400** according to various embodiments of the disclosure.

According to various embodiments of the disclosure, in the input mode using the first electronic device **400**, the function may be continuously switched according to user input entered on the first electronic device **400**.

With reference to FIG. **16A**, while executing a drawing application, the second electronic device **500** may receive a user input for performing drawing and display a result **1610** corresponding to the user input.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing drawing input mode) from the second electronic device **500**.

With reference to FIG. **16B**, the first electronic device **400** may receive a user input **1620** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., one-finger touch on an arbitrary zone of the display **420**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** and the user input **1520**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of changing from a ballpoint pen tool to a brush tool. With reference to FIG. **16B**, it can be seen that the result **1630** of the drawing performed by the user on the first region **810** is a result **1630** of drawing with a brush tool.

With reference to FIG. **16C**, the first electronic device **400** may receive a user input **1640** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., two-finger touch on an arbitrary zone of the display **420**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1640**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of drawing a line with a second color changed from a first color. With reference to FIG. **16C**, it can be seen that the result **1650** of the drawing performed by the user on the first region **810** is a change from the first color to the second color.

With reference to FIG. **16D**, the first electronic device **400** may receive a user input **1660** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., three-finger touch on an arbitrary zone of the display **420**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a

25

function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1660**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be to execute a cutting function. With reference to FIG. **16D**, it can be seen that the user is performing a cutting function on the first region **810** (**1670**).

FIGS. **17A** to **17C** are diagrams illustrating another embodiment of an input mode using the first electronic device **400** according to various embodiments of the disclosure.

According to various embodiments of the disclosure, in the input mode using the first electronic device **400**, the function may be continuously switched according to user input entered on the first electronic device **400**.

With reference to FIG. **17A**, while executing an image editing application, the second electronic device **500** may receive a user input for image editing.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing image editing application and performing image editing mode) from the second electronic device **500**.

With reference to FIG. **17B**, the first electronic device **400** may receive a user input **1710** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., one-finger touch on an arbitrary zone of the display **420**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1710**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of mosaic processing on a region in which a user input is received. With reference to FIG. **17B**, it can be seen that the region **1720** selected by the user has been mosaic processed.

With reference to FIG. **17C**, the first electronic device **400** may receive a user input **1730** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., two-finger touch on an arbitrary zone of the display **420**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** and the user input **1730**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be to execute a cutting function. With reference to FIG. **17C**, it can be seen that a cutting function is being executed for the region **1740** selected by the user.

FIGS. **18A** to **18D** are diagrams illustrating another embodiment of an input mode using the first electronic device **400** according to various embodiments of the disclosure.

26

With reference to FIG. **18A**, while executing a drawing application, the second electronic device **500** may receive a user input for performing drawing and display a result **1810** corresponding to the user input.

According to various embodiments of the disclosure, the first electronic device **400** may receive state information of the second electronic device **500** (executing drawing application and performing drawing input mode) from the second electronic device **500**.

With reference to FIG. **18B**, the first electronic device **400** may receive a user input **1820** on an arbitrary zone of the display **420** of the first electronic device **400** (e.g., double-tap touch on an arbitrary zone of the display **420**).

According to various embodiments of the disclosure, the first electronic device **400** may determine a command for a function to be executed on the second electronic device **500** based on the state information of the second electronic device **500** received from the second electronic device **500** and the user input **1820**, and may control the second electronic device **500** to execute the function corresponding to the determined command. The second electronic device **500** may execute a function corresponding to the determined command. The function corresponding to the determined command may be a function of adding a photograph to the first region **810**. With reference to FIG. **18B**, it can be seen that a list **1830** of photographs that can be added by the user to the first region **810** is displayed on the first region **810**. The second electronic device **500** may receive a user input for selecting at least one photograph from among the photographs included in the list **1830**. With reference to FIG. **18C**, the second electronic device **500** may add a photograph **1840** selected by the user to the first region **810**.

FIGS. **19A** and **19B** are diagrams illustrating another embodiment of an input mode using the first electronic device **400** according to various embodiments of the disclosure.

According to various embodiments of the disclosure, the first electronic device (e.g., first electronic device **400** in FIG. **3**) may determine a command for controlling the second electronic device **500** in accordance with state information of the second electronic device **500** and a user input received by the first electronic device **400**. The first electronic device **400** may control various electronic components of the first electronic device **400** to output a feedback indicating the function corresponding to a command. The feedback indicating a function may be output using the display, vibrations or sounds.

According to various embodiments of the disclosure, the first electronic device **400** may control the display **420** to display a feedback indicating a function corresponding to the determined command.

With reference to FIG. **19A**, the first electronic device **400** may control the display **420** to display a feedback **1910** indicating the function corresponding to the determined command (e.g., adjusting the volume of the sound output on the second electronic device **500**). The feedback **1910** may also be displayed on the second electronic device **500**. With reference to FIG. **19A**, the second electronic device **500** may control the display **520** to display the feedback **1910** indicating the function corresponding to the determined command (e.g., adjusting the volume of the sound output on the second electronic device **500**).

According to various embodiments of the disclosure, the first electronic device **400** may control the sound output device (e.g., sound output device **155** in FIG. **1**) or the haptic

module (e.g., haptic module 179 in FIG. 1) to output a feedback indicating the function corresponding to the determined command.

With reference to FIG. 19B, the first electronic device 400 may determine a command corresponding to a user input 1930 and state information of the second electronic device 500 (e.g., a drawing application is running on the second electronic device 500), and may output a feedback indicating the function corresponding to the determined command (e.g., drawing a line with a second color changed from a first color) as a vibration or sound. The feedback may also be displayed on the second electronic device 500.

With reference to FIG. 19B, the second electronic device 500 may control the display 520 to display a feedback 1940 indicating the function corresponding to the determined command (e.g., drawing a line with a second color changed from a first color).

FIG. 20 is a diagram illustrating another embodiment of an input mode using the first electronic device 400.

According to various embodiments of the disclosure, the first electronic device 400 may receive a user input by using a plurality of sensors included in the first electronic device 400. The first electronic device 400 may determine a command for controlling the second electronic device 500 based on state information of the second electronic device 500 and a user input received using a plurality of sensors included in the first electronic device 400.

According to various embodiments of the disclosure, the first electronic device 400 may receive a user input collected by at least two sensors among a display (e.g., display 420 in FIG. 4), a pressure sensor (not shown), an acceleration sensor (not shown), and a gyro sensor (not shown).

With reference to FIG. 20, the first electronic device 400 may receive state information of the second electronic device (e.g., a video playback application is running on the second electronic device) from the second electronic device 500. The first electronic device 400 may receive a user input 2010 for rotating the first electronic device 400 while contact is being made with an arbitrary zone on the display 420.

According to various embodiments of the disclosure, the first electronic device 400 may determine a command for a function to be executed on the second electronic device 500 based on the state information of the second electronic device 500 and the user input 2010, and may control the second electronic device 500 to execute the function corresponding to the determined command. With reference to FIG. 20, the function corresponding to the determined command may refer to a function of adjusting the volume of sound output from the second electronic device 500. The first electronic device 400 may identify the direction of rotation of the first electronic device 400 and may control the volume of sound output from the second electronic device 500 based on the direction and degree of rotation. An electronic device according to various embodiments of the disclosure may include: a communication module to transmit and receive data to and from an external electronic device; a display; a memory to store commands for executing, on the external electronic device, functions mapped to state information of the external electronic device and user inputs; and a processor, wherein the processor may be configured to: control the communication module to be connected to the external electronic device; receive first state information of the external electronic device from the external electronic device; receive a first user input on an arbitrary zone of the display; determine a first command corresponding to the first state information and a characteristic of

the first user input among the commands stored in the memory; and control the external electronic device to execute a function corresponding to the first command.

In the electronic device according to various embodiments of the disclosure, the first state information of the external electronic device may include information indicating an application running on the external electronic device or information indicating a function executed in the application.

In the electronic device according to various embodiments of the disclosure, the processor may be configured to: receive second state information different from the first state information; receive a second user input identical to the first user input; determine a second command different from the first command based on the second state information and the second user input; and control the external electronic device to execute a function corresponding to the determined second command.

In the electronic device according to various embodiments of the disclosure, the processor may be configured to output a feedback indicating the function corresponding to the determined first command on the electronic device or the external electronic device.

In the electronic device according to various embodiments of the disclosure, the processor may control the display to display a first region for receiving the first user input and a second region including at least one object indicating a function executable on the external electronic device, and the first user input may include a touch input for an arbitrary zone on the first region.

In the electronic device according to various embodiments of the disclosure, the processor may be configured to identify a function executable on the external electronic device based on the first state information of the external electronic device.

In the electronic device according to various embodiments of the disclosure, in response to an update of the state information of the external electronic device, the processor may be configured to identify a function executable on the external electronic device based on the updated state information.

In the electronic device according to various embodiments of the disclosure, the first user input may be set to be detected by the display or an acceleration sensor included in the electronic device.

In the electronic device according to various embodiments of the disclosure, the processor may be configured to: control the external electronic device to maintain execution of the function corresponding to the first command in response to confirming that the first user input is maintained; and control the external electronic device to execute a function that has been executed before the function corresponding to the first command in response to confirming that the first user input is ended.

In the electronic device according to various embodiments of the disclosure, in response to receiving a third user input for changing the function corresponding to the first user input and receiving a fourth user input identical to the first user input, the processor may be configured to control the external electronic device to execute a function corresponding to a third command different from the first command.

An electronic device according to various embodiments of the disclosure may include: a communication module to transmit and receive data to and from an external electronic device; a display; and a processor, wherein the processor may be configured to: control the communication module to

be connected to the external electronic device; transmit state information of the electronic device to the external electronic device; receive a first command corresponding to the state information of the electronic device and a characteristic of a user input received by the external electronic device from the external electronic device; and execute a function corresponding to the first command.

In the electronic device according to various embodiments of the disclosure, the state information of the electronic device may include information indicating an application running on the electronic device or information indicating a function executed in the application.

In the electronic device according to various embodiments of the disclosure, the processor may be configured to transmit the updated state information to the external electronic device when the function executed in the application is changed.

In the electronic device according to various embodiments of the disclosure, the processor may output an object indicating the function corresponding to the first command.

FIG. 21 is a diagram illustrating an operation method 2100 of the first electronic device according to various embodiments of the disclosure.

According to various embodiments of the disclosure, at operation 2110, the first electronic device (e.g., first electronic device 400 in FIG. 3) may receive state information of the second electronic device (e.g., second electronic device 500 in FIG. 3). The state information of the second electronic device 500 may include information indicating an application running on the second electronic device 500 or information indicating a function executed in the application. When an application is executed or when a function executed in a running application is changed, the second electronic device 500 may transmit state information of the second electronic device 500 to the first electronic device 400.

According to various embodiments of the disclosure, at operation 2120, the first electronic device 400 may receive a user input for controlling the second electronic device 500.

According to various embodiments of the disclosure, the user input may be a user input for controlling an application running on the second electronic device 500 or a function that can be used in the running application (e.g., execution of a function or change of a function).

According to various embodiments of the disclosure, the first user input may indicate a user input for an arbitrary zone on the display (e.g., display 420 in FIG. 4). The arbitrary zone on the display 420 may indicate a region that is not specified in advance. According to various embodiments of the disclosure, the first electronic device 400 may receive a user input for an unspecified arbitrary zone on the display 420. As the user can perform an input for an unspecified arbitrary zone on the display 420, the phenomenon in which the user's gaze is shifted from the first region where the user input is entered (e.g., first region 810 in FIG. 8) to the second region including at least one object for executing a desired function (e.g., second region 820 in FIG. 8) can be prevented, which can increase the work efficiency of the user.

According to various embodiments of the disclosure, the user input may be sensed by various components of the first electronic device 400. For example, the display 420 of the first electronic device 400 may detect a user input entered on the display 420. As another example, among various sensors included in the first electronic device 400 (e.g., sensor module 176 in FIG. 1), the proximity sensor, the gyro sensor, or the acceleration sensor may sense a user input for changing the posture of the first electronic device 400.

According to various embodiments of the disclosure, at operation 2130, the first electronic device 400 may determine a command corresponding to the state information of the second electronic device 500 and the user input. The command may indicate a command for controlling an application running on the second electronic device 500 or a function that can be used in the running application.

According to various embodiments of the disclosure, at operation 2140, the first electronic device 400 may control the second electronic device 500 to execute a function corresponding to the determined command. The second electronic device 500 may execute a function corresponding to the command determined by the first electronic device 400.

An operation method of an electronic device according to various embodiments of the disclosure may include: connecting to an external electronic device; receiving first state information of the external electronic device from the external electronic device; receiving a first user input for an arbitrary zone on a display; determining a first command corresponding to the first state information and a characteristic of the first user input from among commands stored in a memory that stores commands for executing, on the external electronic device, functions mapped to state information of the external electronic device and user inputs; and controlling the external electronic device to execute a function corresponding to the first command.

In the operation method of the electronic device according to various embodiments of the disclosure, the first state information of the external electronic device may include information indicating an application running on the external electronic device or information indicating a function executed in the application.

The operation method of the electronic device according to various embodiments of the disclosure may further include: receiving second state information different from the first state information; receiving a second user input identical to the first user input; determining a second command different from the first command based on the second state information and the second user input; and controlling the external electronic device to execute a function corresponding to the determined second command.

The operation method of the electronic device according to various embodiments of the disclosure may further include outputting a feedback indicating the function corresponding to the determined first command on the electronic device or the external electronic device.

The operation method of the electronic device according to various embodiments of the disclosure may further include controlling the display to display a first region for receiving the first user input and a second region including at least one object indicating a function executable on the external electronic device, and the first user input may be a touch input for an arbitrary portion on the first region.

The operation method of the electronic device according to various embodiments of the disclosure may further include: controlling the external electronic device to maintain execution of the function corresponding to the first command in response to confirming that the first user input is maintained; and controlling the external electronic device to execute a function that has been executed before the function corresponding to the first command in response to confirming that the first user input is ended.

The electronic device according to various embodiments may be one of various types of electronic devices. The electronic devices may include, for example, a portable communication device (e.g., a smartphone), a computer

device, a portable multimedia device, a portable medical device, a camera, a wearable device, or a home appliance. According to an embodiment of the disclosure, the electronic devices are not limited to those described above.

It should be appreciated that various embodiments of the present disclosure and the terms used therein are not intended to limit the technological features set forth herein to particular embodiments and include various changes, equivalents, or replacements for a corresponding embodiment. With regard to the description of the drawings, similar reference numerals may be used to refer to similar or related elements. It is to be understood that a singular form of a noun corresponding to an item may include one or more of the things, unless the relevant context clearly indicates otherwise. As used herein, each of such phrases as “A or B,” “at least one of A and B,” “at least one of A or B,” “A, B, or C,” “at least one of A, B, and C,” and “at least one of A, B, or C,” may include any one of, or all possible combinations of the items enumerated together in a corresponding one of the phrases. As used herein, such terms as “1st” and “2nd,” or “first” and “second” may be used to simply distinguish a corresponding component from another, and does not limit the components in other aspect (e.g., importance or order). It is to be understood that if an element (e.g., a first element) is referred to, with or without the term “operatively” or “communicatively”, as “coupled with,” “coupled to,” “connected with,” or “connected to” another element (e.g., a second element), it means that the element may be coupled with the other element directly (e.g., wiredly), wirelessly, or via a third element.

As used herein, the term “module” may include a unit implemented in hardware, software, or firmware, and may interchangeably be used with other terms, for example, “logic,” “logic block,” “part,” or “circuitry”. A module may be a single integral component, or a minimum unit or part thereof, adapted to perform one or more functions. For example, according to an embodiment, the module may be implemented in a form of an application-specific integrated circuit (ASIC).

Various embodiments as set forth herein may be implemented as software (e.g., the program **140**) including one or more instructions that are stored in a storage medium (e.g., internal memory **136** or external memory **138**) that is readable by a machine (e.g., the electronic device **101**). For example, a processor (e.g., the processor **120**) of the machine (e.g., the electronic device **101**) may invoke at least one of the one or more instructions stored in the storage medium, and execute it, with or without using one or more other components under the control of the processor. This allows the machine to be operated to perform at least one function according to the at least one instruction invoked. The one or more instructions may include a code generated by a compiler or a code executable by an interpreter. The machine-readable storage medium may be provided in the form of a non-transitory storage medium. Wherein, the term “non-transitory” simply means that the storage medium is a tangible device, and does not include a signal (e.g., an electromagnetic wave), but this term does not differentiate between where data is semi-permanently stored in the storage medium and where the data is temporarily stored in the storage medium.

According to an embodiment, a method according to various embodiments of the disclosure may be included and provided in a computer program product. The computer program product may be traded as a product between a seller and a buyer. The computer program product may be distributed in the form of a machine-readable storage medium

(e.g., compact disc read only memory (CD-ROM)), or be distributed (e.g., downloaded or uploaded) online via an application store (e.g., PlayStore™), or between two user devices (e.g., smart phones) directly. If distributed online, at least part of the computer program product may be temporarily generated or at least temporarily stored in the machine-readable storage medium, such as memory of the manufacturer’s server, a server of the application store, or a relay server.

According to various embodiments, each component (e.g., a module or a program) of the above-described components may include a single entity or multiple entities. According to various embodiments, one or more of the above-described components may be omitted, or one or more other components may be added. Alternatively or additionally, a plurality of components (e.g., modules or programs) may be integrated into a single component. In such a case, according to various embodiments, the integrated component may still perform one or more functions of each of the plurality of components in the same or similar manner as they are performed by a corresponding one of the plurality of components before the integration. According to various embodiments, operations performed by the module, the program, or another component may be carried out sequentially, in parallel, repeatedly, or heuristically, or one or more of the operations may be executed in a different order or omitted, or one or more other operations may be added.

The invention claimed is:

1. An electronic device comprising:

a communication module to transmit and receive data to and from an external electronic device;

a display;

a memory to store commands for executing, on the external electronic device, functions mapped to state information of the external electronic device and user inputs; and

a processor,

wherein the processor is configured to:

control the communication module to communicatively connect to the external electronic device;

receive first state information of the external electronic device from the external electronic device, the first state information of the external electronic device including information indicating an application running on the external electronic device or information indicating a function executed in the application;

receive a first user input on an arbitrary zone of the display;

determine a first command based on the first state information and a characteristic of the first user input;

control the external electronic device to execute a function corresponding to the first command;

receive second state information of the external electronic device, the second state information including information indicating an different application running on the external electronic device or information indicating a different function;

receive a second user input identical to the first user input; determine a second command different from the first command based on the second state information and the second user input; and

control the external electronic device to execute a function corresponding to the second command.

2. The electronic device of claim **1**, wherein the processor is configured to output a feedback indicating the function

33

corresponding to the determined first command on the electronic device or the external electronic device.

3. The electronic device of claim 1, wherein:

the processor is configured to control the display to display a first region for receiving the first user input and a second region including at least one object indicating a function executable on the external electronic device; and

wherein the first user input includes a touch input for an arbitrary zone on the first region.

4. The electronic device of claim 1, wherein the processor is configured to identify a function executable on the external electronic device based on the first state information of the external electronic device.

5. The electronic device of claim 1, wherein in response to an update of the state information of the external electronic device, the processor is configured to identify a function executable on the external electronic device based on the updated state information.

6. The electronic device of claim 1, wherein the first user input is set to be detected by the display or an acceleration sensor included in the electronic device.

7. The electronic device of claim 1, wherein the processor is configured to:

control the external electronic device to maintain execution of the function corresponding to the first command in response to confirming that the first user input is maintained; and

control the external electronic device to execute a function that has been executed before the function corresponding to the first command in response to confirming that the first user input is ended.

8. The electronic device of claim 1, wherein in response to receiving a third user input for changing the function corresponding to the first user input and receiving a fourth user input identical to the first user input, the processor is configured to control the external electronic device to execute a function corresponding to a third command different from the first command.

9. An electronic device, comprising:

a communication module to transmit and receive data to and from an external electronic device;

a display; and

a processor,

wherein the processor is configured to:

control the communication module to communicatively connect to the external electronic device;

transmit first state information of the electronic device to the external electronic device, the first state information of the electronic device including information indicating an application running on the electronic device or information indicating a function executed in the application;

receive a first command corresponding to the first state information of the electronic device and a characteristic

34

of a first user input received by the external electronic device from the external electronic device;

execute a function corresponding to the first command; transmit the second state information of the electronic device to the external electronic device, the second state information, the second state information of the electronic device including information indicating a different application running on the electronic device or information indicating a different function executed in the application;

receive a second command different from the first command corresponding to the second state information of the electronic device and a characteristic of a second user input received by the external electronic device, the second user input being identical to the first user input; and

execute a function corresponding to the second command.

10. The electronic device of claim 9, wherein the processor is configured to output an object indicating the function corresponding to the first command.

11. An operation method of an electronic device, the operation method comprising:

communicatively connecting to an external electronic device;

receiving first state information of the external electronic device from the external electronic device, the first state information of the external electronic device including information indicating an application running on the external electronic device or information indicating a function executed in the application;

receiving a first user input for an arbitrary zone on a display;

determining a first command corresponding to the first state information and a characteristic of the first user input from among commands stored in a memory that stores commands for executing, on the external electronic device, functions mapped to state information of the external electronic device and user inputs;

controlling the external electronic device to execute a function corresponding to the first command;

receiving second state information of the external electronic device, the second state information including information indicating a different application running on the external electronic device or information indicating a different function;

receiving a second user input identical to the first user input

determining a second command different from the first command based on the second state information and the second user input; and

controlling the external electronic device to execute a function corresponding to the second command.

* * * * *